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ABSTRACT

Changing employer-based training represents one strategy that U.S. firms are adopting to confront recent transformations in the global economy. The new competitive conditions place new and different demands on workers, more of whom are being called upon to use technical, conceptual, and communications skills. Approaches to training in particular sectors depend on numerous factors, including investment in new technology, labor supply constraints, and broad patterns of sectoral competition and restructuring. In business services and nonretail banking, U.S. firms have gone far toward combining training with technological and organizational changes designed to make firms and workers more responsive to the market. In the textile industry, which is a mature manufacturing industry that has responded to international competition with increased market specialization, more direct and interactive relationships among supplier and producer companies, and "quick response" production systems, management views the training challenge as a combination of improving workers' basic skills, significant upgrading of technical skills, and strengthening of supervisor capabilities. In retailing, complex and lengthy training for managers is combined with relatively simple training for lower-level workers. Areas for policy action include basic skills training and measures to enhance the role of mid-level institutions well placed to gather and disseminate information about successful training approaches. (Author/YLB)

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TRAINING AND COMPETITIVENESS IN U.S. MANUFACTURING AND SERVICES: TRAINING NEEDS AND PRACTICES OF LEAD FIRMS IN TEXTILE, BANKING, RETAILING AND BUSINESS SERVICES

Contract Report

Submitted to the Office of Technology Assessment by

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February 1990

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All opinions in this report are those of the authors and do not represent the views of the Office of Technology Assessment, U.S. Congress

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Abstract

Changing firm-based training represents one of an array of strategies that U.S. firms are adopting to confront recent transformations in the global economy. The new competitive conditions place new and different demands on workers, more of whom are being called upon to use technical and specialized skills, conceptual skills, and communications skills.

Approaches to training in particular sectors depend on numerous factors, including the level of investment in new technology, labor supply constraints, and broad patterns of sectoral competition and restructuring. In the dynamic, information-based services, such as business services and non-retail banking, U.S. firms have gone far toward combining training with technological and organizational changes designed to make firms and workers more responsive to the market. In the textile industry, a mature U.S. manufacturing industry that has responded to international competition by increased market specialization, by developing more direct and interactive relationships among supplier and producer companies, and by instituting "quick response" production systems, management views the training challenge as a combination of improving workers' basic skills, significant upgrading of technical skills, and strengthening supervisor capabilities. In retailing, complex and lengthy training for managers is combined with relatively simple training for lower-level workers--though much more formalized and developed than in the past.

Viewing training in the context of broader competitive pressures and strategies by sector allows us to identify some areas for policy action that would potentially have a positive effect on both industry performance and educational advancement for workers. The case studies suggest that there is growing public sector support for basic skills training in some geographical areas and sectors. But the research also suggests that several policies and institutions could also play an important role in a broadly defined training strategy. Examples are measures that would enhance the role of employers' associations, union-employer partnerships, state and local agencies, and other mid-level institutions that would be well placed to gather and disseminate information about successful training approaches in a given sector and possibly assist in their implementation. More research is also needed on the effects of changes in the organization of work on training.

EXECUTIVE SUMMARY

The background to changes in firm-based training

Transformations in the international economy in the last decade and a half have forced U.S. firms to alter their competitive strategies, including, in many instances, revising their approach to training. Several broad economic trends are key:

- markets are becoming more diversified and fragmented, and the pace of change in markets is also faster.

- greater international competitiveness exists, marked by a higher volume of trade in non-traditional goods and a larger number of producers reaching the global marketplace.

These changes have impelled several profound adjustments in both manufacturing and services:

- in manufacturing, many firms seek to produce shorter series and a wider variety of goods using more flexible technology and work organization.

- in the services, many firms too have moved toward specializing in particular market niches while at the same time offering a wider array of services. Projecting a coherent market image (often through the use of proprietary technology) and reorienting a larger part of the workforce toward sales and customer service have become important priorities.

Implications for training

The above trends imply a new relationship between training and work organization. As firms alter their internal organization in ways designed to make them more responsive to market shifts, skill demands on workers also change. Widespread trends include:

- greater demand for technical and specialized skills.

- increased emphasis on conceptual skills.

- the need in nearly all jobs for good communications skills.

Changes in work organization themselves alter how training is performed. More flexible work assignments, in particular, build some training into the jobs and require continual retraining of workers.

Comparison of training in four sectors

The extent to which firms invest in expanded training or seek to make major organizational changes depends in part on other factors, particularly the degree to which firms may still substitute technology for labor, and the extent to which local labor supply conditions hinder altering recruiting strategies as a way of upgrading the labor force.

The four sectors studied display different responses to the changed economic conditions after the mid-1970s, and changes in training also play a different role in firms' competitive strategies. The findings from the four case studies are summarized in Table 0.1. The main findings regarding training are as follows:

1. Business services and banking (particularly "high end" commercial and investment banking) have been more successful than many other U.S. industries in integrating organizational changes, applications of new technology, and the introduction of new types of training. Hallmarks of the approach of successful firms include:

- a fluid relationship between job preparation and assignments for line workers and managers. Because tasks are structured around information processing, all employees need to have some training in the use of tools such as computers and the interpretation of data transmitted through what is often proprietary software.

- training as a byproduct of the way career ladders and jobs function. Workers frequently perform many varied tasks on the job, and they also move frequently among different divisions and departments, requiring them to submit to continual retraining, both formal and informal.

2. The textile industry, facing severe constraints in seeking to recruit more experienced or better trained workers, has increased attention to:

- basic skills training for workers. Particularly as a result of high investment in costly new machinery in many plants, and as part of an effort to install and improve "quick response" production, many firms have begun to stress the importance of improving workers' basic literacy and numeracy skills.

- technical training. The new machinery in many plants requires more sophisticated knowledge on the part of maintenance personnel, and this need is reflected in new efforts to provide more technical training to exiting personnel.

3. Retailing (and possibly other service sectors that continue to employ high proportions of low-wage and temporary and part-time workers) has taken a hybrid approach to training that is characterized by:

- a heavier burden of training for managers, who face greater and more varied responsibilities.

- efforts to formalize training for low-level workers, with an emphasis on preparing workers in all departments to know company policy and perform more consistently in providing customer service.

Conclusions

The comparative analysis of training in the four sectors supports two main conclusions:

1. Training is more effective when it is viewed as an integral part of a strategy of internal work reorganization. That is, new and effective training programs are those that do not seek merely to teach a new mix of routinized tasks to workers but instead build learning into more flexible job assignments and organizational structures.

2. Public policy can clearly play a role in promoting more effective types of training. While aid for basic skills and literacy instruction is positive, and clearly very important in some sectors, this "obvious" policy approach may be complemented by other, more indirect, strategies, for example:

- further research of the training effects of flexible work organization.

- the strengthening of institutions that can not only gather and disseminate information about effective training that is relevant to particular sectors but also assist in their implementation. Examples are employer associations, regional or state-level training initiatives, sectoral-wide union-employer partnerships, agencies to aid in establishing intra- or inter-firm cooperation, and business-school partnerships.

Table 0.1 Comparison of Restructuring and Training Strategies in Four Sectors

	Textile	Banking	Business Services	Retailing
Response of U.S. firms to international economy	Specialization by market segment; technological upgrading; Development of interactive relationships between suppliers and customers.	Internationalization: shift to new products, new markets technological upgrading	Internationalization; move "upscale" to higher-level business services; development of proprietary products technological upgrading	Market segmentation Decline of large national chains and department stores; rise of regional and specialty chains; technological upgrading
Internal restructuring	Introduction of "quick response"; more attention to fashion trends in subsectors	Front and back-office functions collapsed; more attention to sales and customer service at all levels.	Greater specialization of personnel; greater rotation of personnel through various departments.	More burden on store and corporate managers; introduction of systems linking inventory, supply and sales.
Labor market supply constraints	Shortage of technical workers; shortage of workers with high school education and beyond.	Shortages of qualified workers for low-tier jobs; Emerging constraints on hiring high-level skilled workers.	Emerging constraints on supply.	Shortages of workers with sufficient basic skills especially in some urban markets; no consistent source for management ranks.
Recruiting strategies	Limited in changing recruiting; some efforts to work with local community colleges; At low levels take "whoever can get"	Hire more women and temporary and part-time workers as way of increasing skill mix; more external direct hiring at management level. Use of technology to replace low-level jobs.	Increased hiring of specialists; for generalists, preference for MBAs.	More temporary and part-time workers, students, and retirees; New emphasis on internal promotion to management ranks but increasing emphasis on minimum college education among managers. Use of technology applications to replace low-level jobs.
Training strategies	Greater preoccupation with basic skills; more attention to technical training, in partnership with community colleges.	Continued change in training as proprietary technology changes; intensive basic-training for entry-level workers; intensive training opportunities for management.	Intensive learning on the job Flexible approach to formal training; formal training typically intensive; ad hoc individual and group training as needed; some intensive training in firm culture for entry workers.	Emphasis on short but effective training for low-level workers; for managers, lengthy and progressive training at stages of promotion.

I. Introduction

Changes in the international economy over the last decade and a half have had profound effects on employers' strategies and on workers' lives. No element of the complex process summarized by the term "firm-based training" has been unaffected by changes in the way firms and industries are doing business. For the student of worker training, it has become increasingly difficult to isolate parts of the training process for study since very little in the surrounding environment can reasonably be said to be constant. The way in which tasks are organized, how and when knowledge of particular skills is related to larger bodies of knowledge, and the importance of training to the competitiveness of the firm--all these, and other, elements of training have become closely interrelated, and all are changing rapidly.

If this situation invites confusion, it also signals opportunity. There is some evidence that the new competitive conditions have already heightened employers' interest in improving and expanding training. Further, awareness is growing that narrow forms of training are no longer appropriate to less structured, more rapidly changing workplaces. Thus the opportunity exists for a broader commitment to training that will narrow the gap between actions that are good for the firm and

those that contribute to the broader social goals of educational enhancement and worker mobility.

In this report, we will examine several trends in industry restructuring that set the stage for new types of workplace organization that can both enhance firm competitiveness and contribute to educational development. Yet we will also show that one of the lessons of cross-industry comparison is that the opportunity for combining the pursuit of competitive and social goals extends unevenly, both across industries and through different strata of the same industry's workforce.

By focusing on industries rather than firms or training programs, we can explore the relationship of worker skills to the unfolding of new competitive conditions and account for differences in firms' commitment to revising training. We analyze recent transformations and the implications for training in four sectors: banking, the textile industry, retailing, and business services. Each case study will highlight pressures on firms brought about by the intensification of international competition, industry adjustments, especially internal reorganization, and the implications of these trends for training.

Our analysis rests on the assumption that firms pursue varying combinations of adjustment strategies that include technological innovation and adoption, reorganization of the labor process, changing labor recruitment strategies, restructuring of internal labor markets, and, as one element in

this complex of strategies, changes in firm-based training. The precise mix of strategies varies in the four different sectors, as does the degree of commitment to training. In all the cases, however, we find an increased emphasis on training.

The comparison between several highly dynamic sectors in the services and a struggling, mature manufacturing sector not only reveals different approaches to training but also suggests a link between training and growth: U.S. competitiveness in manufacturing is in peril, but many U.S. services firms have remained international leaders in rapidly changing markets. Capitalizing on the strength of the U.S. higher educational system, these firms have clearly developed work forces capable of using (and creating) advanced technologies, serving an increasingly diverse and geographically dispersed customer base, and functioning in a rapidly changing work environment. Such successes, together with the experiences of lead manufacturing firms that have survived the recent shake-outs, have much to teach about the potential contributions of training to future U.S. competitiveness.

Broadly stated, the contrast between training strategies in dynamic and competitive firms and in less successful firms and sectors lies in the emphasis in the former on training as a component of broader organizational strategies. That is, in successful firms efforts to increase responsiveness to the market have more often involved changes not just in the way workers perform their jobs but also in the way their jobs relate to other

positions inside the firm. Firm-based training becomes more important as systems for organizing work (and the technologies associated with such systems) become more closely tied to broader market strategies. The organizational changes themselves also appear to bring benefits to training: by challenging workers to learn on the job, by incorporating managers as well as workers in training, and by emphasizing the immediate relevance of training to job and firm performance.

U.S. service firms appear to have been, on average, more successful than most manufacturing firms in integrating training with broader organizational changes. Through the early 1980s, most U.S. manufacturing firms have continued to rely largely on productivity enhancing capital improvements structured in such a way as to minimize changes in workers' jobs. In this approach, training entails mainly teaching workers to handle a new mix of tasks within positions that are defined the same way and relate in essentially the same way to other jobs. More recently many manufacturing firms are beginning to modify this pattern by incorporating organizational changes -- creating teams of production workers in some divisions, for example.[1] Nevertheless, until recently, U.S. manufacturing has moved

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[1] For a description of very significant organizational changes in the apparel industry, see Thomas Bailey, "Technology, Skills, and Education in the Apparel Industry," Technical Paper No. 7. New York: National Center on Education and Employment, Teachers College, Columbia University, November 1989.

cautiously and slowly in this direction.[2] A sharp division still tends to exist between training for employees involved directly with production -- with its own sharp split between narrow job training and newer, basic skills training -- and training for managers and employees with little direct contact with production such as corporate managers, engineers, and marketing and research personnel. Many higher level service firms have blurred the distinction between production and managerial or professional positions. As workers involved in production increasingly perform many of the same tasks as managers--information processing and sales, for example--they logically need to receive training that overlaps in form and content.

In the case studies, the relationships among the distinctions between production and management, organizational change, and training strategies emerge clearly. Textile makers employ a high proportion of unskilled, poorly educated workers. Consequently, textile managers place special emphasis on supplementing the basic education of their employees as a means of improving work performance. Firms that survived the industry's decline in the late 1970s and early 1980s also implemented some organizational changes. Moreover there have been dramatic changes in the relationships among firms in the fiber, textiles, apparel, and retail sectors. But at the same

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[2] See Charles Sabel, Gary Herrigel, Richard Kazis, and Richard Deeg, "How to Keep Mature Industries Innovative," Technology Review (April 1987): 27-35.

time, despite modernization, the textile industry maintains the basic distinctions between workers involved directly in production and higher level managerial, engineering, and marketing personnel. The differentiation between operators and shop floor supervision are not as sharp. Foreman and supervisors have usually risen through the ranks and have therefore received substantially the same training as the operators. And supervisors often directly help out operators or repair personnel when problems occur.

In retailing there also remains a sharp distinction between store-level personnel and corporate managers, although in the stores, assistant, department and even store managers remain heavily involved in the physical process of production, as do foremen and supervisors in textiles. In a typical supermarket, for example, the store manager may lend a hand to unload a truck; he/she may deal with customer complaints if the assistant store manager is not available to do it; he/she may even staff a check out counter to help clear traffic.[3] Thus in retailing, training programs have remained fairly narrow in focus at lower levels (where work organization has also changed little), while much more extensive and broad-based training in management ranks has supported aggressive new marketing strategies.

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[3]. One very large and very successful drugstore chains that we visited -- Eckerd's -- has an explicit policy that everyone in the store, including pharmacists and store managers, are expected to step in and staff check-out counters to clear traffic peaks.

Banking demonstrates yet another pattern. In this sector we find clear differences among training strategies in various subsectors. Many retail banks seek to insulate some key lower-level positions--that of tellers, for example--from the greater skill demands raised by technological and organizational change elsewhere in the banks. In the investment and commercial banks, distinctions between management and production have been significantly blurred. Most investment or commercial banking products are produced by exempt personnel, ranging from junior professionals to experienced senior managers. Thus these banks have promoted continual retraining of a more flexibly organized workforce.

In the software and management consulting sectors are similar to these advanced banking sectors in that already highly educated workers continually participate in further training as the content of jobs and their relation to other jobs change frequently. Organizational flexibility combined with extensive firm-based training have made U.S. firms in these sectors strong competitors in international markets.

In summary, this report will confirm that the record of recent changes in firm-based training is mixed. On one side, we find expanded training opportunities for some workers and the prospect of less routinized, more variable work. On the other side, we see reduced opportunities for the relatively unskilled, who may never have the chance to enter the work force, and, for many who do, an increasingly uncertain environment that does not

necessarily bring more opportunity. For particular industries, the message may be mixed as well. Long-term adjustment strategies call for substantial internal reorganization and revamping of training. But many factors can lead firms to adopt short-term solutions, such as focusing on improving technology-specific and product-specific training, while they postpone or seek to avoid changes that would ultimately have a more profound effect on their international competitiveness by developing critical human resources and organizational flexibility.

The strategies adopted by particular sectors represent a complex reaction to broader changes that have characterized the global economy in the last decade and a half. An understanding of certain aspects of this broader process of economic restructuring is essential background to the case analyses that follow.

The end of an era of training for mass production

It is by now commonplace to assert that the global economy is entering a new phase and that the paradigms of economic growth of the postwar decades no longer hold sway. Major changes such as the explosive growth of services, the rise of a handful of highly successful newly industrializing countries, and the rapid expansion of international trade are now seen to fit a comprehensive pattern of economic restructuring that in turn is affecting every aspect of social and political life. A full

discussion of the causes of this process are beyond the scope of this report, and many of the consequences remain to be determined. It is clear, however, that any discussion of the challenges to worker training must be set in the context of this larger transformation.

Observers now agree that one of the casualties of the new era is mass production as a model for industrial and work organization. Explanations of this crisis of mass production tend to focus on demand factors. A saturation of markets for standardized goods and services, the argument goes, has led to rapidly accelerating differentiation of demand for consumer products, which has been facilitated by, and has contributed to, the more rapid introduction of new technologies, particularly those based on micro-computer technology. The response of producers to this shift has also prompted increasing diversification of demand for producer goods and services. The effect of these trends combined with the increasing internationalization of both markets and production is that nearly all firms are facing greater competition in more variable and more fragmented markets. This has resulted, for example, in the spread of fashion-consciousness to previously standardized segments of many consumer markets.[4]

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[4] On the break-up of mass markets and its consequences for production, see Michael Piore and Charles Sabel, The Second Industrial Divide (New York: Basic Books, 1984).

In manufacturing, the crisis of mass production has denoted a shift away from the general strategy of employing specialized machinery for fixed stages of manufacturing production. Instead, there is evidence of resurgence of a pattern involving use of general-purpose machinery to perform a more varied set of tasks. The goal of this change is to make it possible for firms to produce a wider range of goods and to respond more quickly to market shifts. New technologies have sometimes facilitated this objective, but they have not driven the process. Indeed, the changeover to flexible manufacturing has itself contributed to the development of new technologies as skilled workers have become more engaged in the "tinkering" that produces technological adjustments in manufacturing.[5]

Although much of the literature on the demise of the Fordist paradigm of production and its effects has focussed on the changes taking place in manufacturing, a parallel, though somewhat different, process has also been apparent in the services.[6] The market for relatively standardized services was also becoming saturated in the 1970s, and the resulting

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[5] It is by now well documented, even if not widely accepted, that essentially identical technologies can be employed in radically different ways, ranging from craft to mass production configurations. On the technological sophistication of many small firms and worker-entrepreneurs, see Charles Sabel, Work and Politics (Cambridge: Cambridge University Press, 1982).

[6] For a discussion of the background to these trends in the services, see Thierry Noyelle, Beyond Industrial Dualism (Westview, 1986, Chapter 6; and Thierry Noyelle (ed.) Skills, Wages, and Productivity in the Services Sector (Westview, forthcoming), Chapters 2, 5, 6, and 9.

diversification within existing services was combined with the opening of new markets for entirely new types of services. The organizational changes inside services that accompanied these trends were less immediately apparent than in manufacturing, but they were no less important. Firms adopted numerous strategies to increase their sensitivity to market changes and to be able to respond more flexibly and faster to such shifts. As in manufacturing, the introduction and spread of microcomputer technologies facilitated this effort. For example, the ability to transmit computer-stored data to decentralized locations supported the internationalization of banking services, and computer tracking make it easier to reduce inventory and improve market sensitivity in retailing.

Far more important than technology alone, however, has been the change in organizational and institutional arrangements in which such technological adaptations are embedded. In both manufacturing and services, these changes can range from internal firm reorganizations, to restructuring of entire sectors, to changes in the political institutional framework regulating the production of goods and services. Each of these institutional/organizational adjustments has been the focus of extensive recent research, and we can do little more here than offer a brief overview of such changes. In a later section we will discuss the contrast between skill demands and training in Fordist-style production and in the new, restructured work place.

Restructuring and reorganization.

The recomposition of industries is hardly new, but we can identify several patterns of restructuring that have become increasingly common as adaptations to the competitive pressures and market changes described above. These patterns of restructuring have had a somewhat different character in manufacturing and services, particularly in the United States, where growth patterns in the two sectors have been so different.

In manufacturing, one prominent trend involves the decentralization of production through the distribution of various phases of production to smaller units or subcontractors: in short, the dismantling of the vertically integrated firm. Firms' individual strategies to augment flexibility through such decentralization shapes a new structure in each industry. As various case studies have shown, the actual profile that results depends on, among many other factors, the relationship between subcontractors and client firms: in some cases, the profile that emerges is a flat pyramid, with a small number of firms controlling the finished products and putting out production to a large number of subcontractors; in other cases, the result is a more complex web of producers, with more autonomy for subcontracting firms that supply a larger clientele, contribute substantially to design, and may also produce their own finished goods. In the former cases, enhanced flexibility results from subcontractor specialization, but also from the cheapening of

labor costs and reduced risks for larger firms. In the latter cases, the picture is somewhat better for the small specialized firms, and flexibility results from the enhanced sensitivity to the market at all levels.[7]

An alternative to decentralization in manufacturing is to promote greater responsiveness by reorganizing vertically integrated firms. This can be achieved in at least two ways. One approach is to decentralize internally by creating smaller units of production that are not specialized by function but rather by broad product category or market. The units then tend to constitute microcosms responsible for finishing specific products or ranges of products. The goal is to improve market responsiveness by bringing divisions into closer contact with clients. Another approach is to make discrete units of production more responsive to each other. By reducing inventories at each stage of production, by speeding the transfer of goods from one stage to another, and by reducing the costs of equipment changes required to produce different types and styles of goods, even vertically integrated firms can process orders more quickly and produce a wider variety of goods.

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[7] On this contrast between different patterns of decentralized industry, see Vittorio Capecchi, "The Informal Economy and the Development of Flexible Specialization in Émilia-Romagna," pp. 189-215 in Alejandro Portes, Manuel Castells and Lauren Benton (eds.) The Informal Economy (Baltimore: Johns Hopkins University Press, 1989). See also Lauren Benton, Invisible Factories (Albany: Suny Press, forthcoming).

One possible result of restructuring in manufacturing is the disruption of the traditional hierarchy of productive relations inside firms (and of the hierarchy of firms within an industry). Supervisory tasks, for one thing, become more evenly spread throughout the productive structure. Locations for decision-making about products are multiplied, as are places for contact between production workers and clients. Once the rigid structure of mass production of standardized goods is removed, alternative ways of accomplishing the same tasks present themselves to every worker. Finally, workers must communicate more often, and with more people, in order to adjust their jobs to the changes in production schedule and content that are continually taking place around them. It is important to note, though, that the reorganization of production presents an opportunity for these changes in worker and job functions, but the degree to which firms and industries embrace these opportunities may vary widely.

In services, the scenario has been somewhat different, although the opportunities that result for workers are equally important. To begin with, the structure of work in the services has been less dominated by the principles of mass production. This has to do with the different timing of explosive growth in the services but also results from the fact that services are inherently more highly decentralized. The very act of producing services implies some contact between service workers and customers. Thus retailing, for example, can be more or less concentrated but is always decentralized. Partly as a result,

there has traditionally been more openness in interpreting the procedural norms that structure the tasks performed by service workers. Whereas the Fordist factory aimed at making production workers interchangeable if they could perform the same tasks at the same speed, even the most traditional service firms recognized important qualitative differences in worker performance that had little to do with productivity as conventionally measured. Finally, the separation between supervisory workers and operatives was never so sharp in services as it was in Fordist manufacturing. Managers' jobs traditionally combine supervisory functions with work that directly contributes to the production of services.

While the origins of restructuring were substantially similar in the services, then, the nature of work and work organization has given restructuring a different cast. Services firms have responded to intensified competition by seeking new ways to distinguish themselves in the marketplace. In the process, the very nature of work inside some firms -- the procedures structuring jobs and the technologies used to produce and market services -- have become more closely related to firms' identities. This trend has placed an increasing burden on training since for workers to function even minimally they have to become acquainted with firm-specific technology and practices. It has also meant that managers' training and jobs, and not just those of low-level workers, have been substantially changed.

Moreover, the organizations must build in some capacity for continued change.

In both manufacturing and services, sectoral restructuring has altered the geographical distribution of work. In manufacturing, studies in the 1970s pointed out that the dismantling of Fordist factories was often associated with geographical dispersion of production (including off-shore production).[8] Later studies emphasized the links between flexible manufacturing and the emergence of regional economies in which the close proximity of producers has permitted greater cooperation in technology and product design among subcontractors and clients, inventory reduction as nearby suppliers respond more quickly to orders, and benefits from the overlap between social ties and relationships at work.[9] In the services, the patterns have been somewhat different. The internationalization of markets has forced leading services firms to extend multinational ties; at the same time, in some sectors, regional firms are becoming major competitors again, sometimes by capitalizing off their ability to respond better to local markets, often by finding that they can do a better job of projecting a distinctive market image in a smaller territory, and sometimes by benefitting

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[8] See A. Scott and M. Storper (eds.), Production, Work, Territory (Boston: Allen & Unwin, 1986).

[9] Charles Sabel, "The Reemergence of Regional Economies." Department of Political Science, Massachusetts Institute of Technology, 1987 (mimeo).

from the same networking advantages found in industrial districts.[10]

The political implications of these trends will take some time to play out. Some observers are already suggesting, however, that the economic policy functions of local and regional institutions will be substantially affected by the reemergence of strong sub-national regional economies.[11] As we suggested above, this pattern threatens to involve local and state institutions even more closely in training. This tendency is borne out in industries that are already highly geographically concentrated; for example, in both the textile industry of North Carolina, and the electronics industry in California, state government has been heavily involved in planning and financing sectoral-specific training. In a handful of key cases outside the United States, the strengthening of sub-national regional economies has also helped to solidify local alliances among business, government, and labor in promoting new types of customized training.

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[10] See especially Susan Christopherson and Michael Storper, "The City as Studio, the World as Backlot: Vertical Disintegration in the Motion Picture Industry," Environment & Planning: Space and Society, September, 1986.

[11] See C. Sabel, Ibid.; and Lauren Benton, Invisible Factories, Chapter, 6.

Changes in the demand for skills.

Recent firm and industry restructuring clearly have an effect on the mix of skills used by workers. In some cases, firms enact changes in the organization of work or in specific jobs specifically in order to reduce the level of skills needed. Although deskilling has taken place in some firms and jobs, the effect of recent changes on workers' skills is considerably more complex. Case studies suggest that it is not enough for firms to try to create more flexible production systems by simply making technological changes and by simulating worker participation in a production process that is still highly regimented.[12] Instead, the optimal response would have workers enlisted in the process of anticipating production problems, finding the best way of adjusting production for different, now more variable products, and even in contributing ideas based on their knowledge of production that will feed into product design. Parallel roles can be identified for workers in the services, where competitive conditions now not only link workers' behavior more closely to company image (and ability to protect and garner market share), but also enlist them in the effort to anticipate client needs and customize services accordingly.

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[12] For example, organizing teams on the factory floor in auto manufacturing is the United States is regarded by some as little more than a sophisticated way of achieving speed-up in production. See Mike Parker and Jane Slaughter, Choosing Sides: Unions and the Team Concept (Boston: South End Press, 1988).

The skills now in rising demand can be grouped loosely into three categories:[13]

1. Technical and specialized skills. In manufacturing, the increasing cost and complexity of machinery create a need for more highly skilled technicians. In some industries, technicians used to be routinely recruited from less-skilled positions and given training in-house or sent outside for upgrading. But fewer workers at lower levels have the skills to benefit from upgrading. Even workers recruited from technical programs usually need supplemental training in areas specific to the firm, and they will lack many of the other, non-technical types of skills that are also in rising demand.

Technical skills are also increasingly needed by non-technical personnel. The cost of errors and down-time rises as equipment costs rise and as quick response becomes a priority. Rather than waiting for break-downs or malfunctions, employers would prefer to have line workers capable of noting problems before they become serious and of adjusting to unexpected deviations from normal procedures in order to keep production going. This ability implies a more sophisticated understanding of the technical aspects of production.

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[13] For a more detailed discussion of skills changes that also presents a slightly different typology of new skills, see Thomas Bailey, "Changes in the Nature and Structure of Work: Implications for Firm-Based Training," Conservation of Human Resources, Columbia University, February, 1989.

In the services, the need for technical skills is somewhat different and is most apparent among middle- and some higher-level professionals. Increasing specialization of firms and of units within firms creates a need for higher-level workers to have more specialized training (that of systems analysts, for example) and to be able to change specializations more frequently, as products and jobs change. The accelerating pace of new applications of technology also requires some lower-level workers to learn new technical skills more quickly. And, clearly, as information-processing service firms grow to depend more heavily on computer technology, repair technicians also become more crucial to the smooth operation of firms.

2. Conceptual skills. There is evidence of an increasing need for symbolic rather than concrete knowledge. As tasks become less repetitive and as workers are called upon to interpret more, and more complex, information, they need a more abstract understanding of their work. Computer-based information-processing and production control contribute to this need, but so do work organizations that feature the use of one set of tools to produce a wider variety of products. A line production worker in a metalworking firm, for example, who uses a press to stamp out identical pieces all day needs to understand very little about the task; ask the same worker to use a numerical control machine to cut ten different pieces and he will have to convey in symbols both general information about the task and specific information about how each piece varies from a

general pattern. Or, to take an example from the services, consider the difference in the complexity of jobs for customer service representatives in banks ten years ago, when all or nearly all questions would have pertained to checking and savings accounts, and jobs today, when the same worker would have to remember more information about more products--CDs, money market accounts, brokerage services-- and relate general guidelines to a much more varied set of questions.

The ability to think more abstractly also relates to the capacity, now needed by more workers, to operate in a more uncertain and less well defined work environment. More rapid changes in products and technologies make it less efficient to plan out every contingency or to refer all problems to supervisors. The ability to handle uncertainty is an ill-defined skill, and it is one that remains poorly defined and targeted in most training programs.

3. Communications skills. Workplace changes have made it necessary for many workers to engage in greater and more complex interactions with others. A fundamental characteristic of more flexible production systems is the reduction or elimination of the separations between individuals within firms and between firms at different places in the supply chain. Communication between units of production becomes more immediate, less bureaucratized, and less controlled by formulae for maintaining set inventory levels. At the same time, reorganization within firms makes communication among workers integral to production,

and multiplies the exchanges between workers and clients or customers. In the services, communications skills are increasingly important as contacts with clients and customers are multiplied; they are also crucial to firms' abilities to implement and revise firm-specific practices that enhance firm identity. There remain very few jobs inside services that entail simply physical or routine, repetitive tasks in isolation. Such jobs are eliminated, where possible, through automation, while even those positions commonly regarded as "low-skilled"--for example, counter jobs at fast-food establishments--in fact entail considerable verbal communication with customers and co-workers.

Improved communications skills are no less vital in supervisory ranks. Supervision of the restructured workplace entails not just management but the ability to set strategic goals, to share information with subordinates, to listen to them, and to allow room for autonomous decisions by workers. Middle-level supervisors, in particular, are called upon to stretch their skills in both directions: by conveying information up and down the line, from line workers to top managers, they can make crucial contributions to product innovation and firm planning.

Taken together, the above skills provide a solid basis for employees to garner a deeper understanding of the firm: its structure, its place in the market and within the supply chain, its products and customers. This type of knowledge is not to be confused with the minimal product-specific knowledge or socialization into the firm that most trainees receive, but

rather represents a tremendous potential for organizational adjustment to major market shifts and for fine-tuning in response to smaller fluctuations.

Policy implications

We will develop these points further in the industry case studies that follow. It is worth noting here that the implications of these findings for policy are surprisingly clear, at least as they point toward the general policy areas through which training can best be encouraged and guided. The reader may find it useful to keep these policy areas in mind when turning to the case material:

1. To the extent that firms can be selective in hiring trained, or trainable, workers, they may not readily perceive the benefits of participating in broader-based training to improve basic skills of all workers. Where there is an acute shortage of workers capable of filling even unskilled positions--the textile industry, one of the cases examined in this report, is an example--there may be a growing commitment to expanding firm-based basic education. Some industries have already been taking advantage of federal and state subsidies and programs in this area could profitably expand their efforts with more support. At the same time, employers in industries without the same supply constraints may perceive the long-term benefits of extending such training--indeed, basic skills are clearly fundamental to the

competencies described above and in rising demand for all workers--but they may see less reason to invest in broader-based training. The issue of appropriate training for entry-level workers, of course, links the goal of industry competitiveness to the national objective of revitalizing public education.

2. Much of the evidence we will present in the case studies of this report suggests that U.S. firm-based training is actually of quite high quality--albeit in a limited sense. Particularly in the highly competitive services, we find considerable resources being devoted to training as it assumes a more important, even central, place in establishing firm identity in the marketplace and thus protecting market shares. Yet at another level, U.S. training is decidedly lacking. While the successful existing training tends to be product-specific, technology-specific, and/or specific to particular markets, in-depth examination of current changes suggest a need for a push towards training that is more "theoretical," more adaptable, and better suited to efforts to anticipate rather than simply react to market trends.

The connection between training and internal restructuring of the labor process deserves special attention in this process. Previous studies of the shift to flexible manufacturing have suggested that there is an important training component of production reorganization. Three of the case studies in this report suggest that a similar connection can be made in the services. That is, innovative work relations such as those based

on task rotation, teamwork, apprenticeships, mentor relationships, and cooperatives--and other arrangements designed to inform workers about the fit between their jobs and the larger production process or involve them in problem solving on the job--often have an implicit training component. Unfortunately, the state of current research does not permit us to evaluate rigorously the effectiveness of this work-structured training or to compare it to other types of training. There seems to be considerably more developed institutional supports for such arrangements in competitor nations, at least in manufacturing, ranging from nationally organized apprenticeship programs, to special credit programs for cooperatives, to support for export-oriented producer groups.[14] In services, this difference is not so clear, in part because very little research on the impact of development policies in the services has been done, either in the U.S. or elsewhere, and in part because the impressive growth record of U.S. services to date has tended to discourage a critical look at institutional support for this sector. Nevertheless, recognition of the training effects of productive restructuring implies broadening the definition of public policy that affects training in both sectors to include policy measures related to industry organization.

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[14] Central Italy is a key case in which support for cooperatives, small firms, and various forms of inter-firm cooperation have been very important in promoting industry's international competitiveness. See Vittorio Capecchi, op. cit.

3. One consistent theme in the pages that follow is the different approaches to training in small and large firms. While much of the best training now takes place in large firms, these are also able to attract workers with the most training. Small firms employ a range of ad hoc training strategies and resort frequently to other sources of flexibility (family labor, skilled or unskilled contingent labor, and even off-the-books labor). Thus it would seem that small firms need to be specially targeted in training policy. However, making distinctions between small and large firms is increasingly difficult in sectors in which firms are closely related as part of the same production complex or in which corporate ownership overlaps. And, as the case study of business services shows in this report, some small firms are in fact able to train workers quite effectively because their size permits a more flexible organization that helps train workers by rotating them through many tasks and teaming them up with more experienced workers.

Once again, evidence from cases outside the United States suggests alternatives to policies specifically designed to affect training in small firms.[15] One alternative involves shifting the locus of policy-making in this area to local or sectoral organizations or alliances that have a better chance of reaching

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[15] On the policy implications of comparative studies of sectoral restructuring see Alejandro Portes, Manuel Castells, and Lauren Benton, "The Policy Implications of Informality," in A. Portes, et. al. The Informal Economy (Baltimore: Johns Hopkins University Press, 1989).

small producers and of designing training that is appropriate to local economies and labor markets. This approach is, of course, hardly new in the United States, where state governments, unions, local school districts, and some employers' associations have long been involved in training. The United States has a long, successful tradition of reaching out to small firms in the case of agriculture via its Agricultural Extension Program. Trends of the last decade merely reinforce the logic of concentrating training interventions at levels that are closer to, and maintain more active alliances with, producer networks and that would be more sensitive to sectoral needs and local labor market constraints. Recent efforts by the American Banking Association to gauge new skill needs and develop appropriate training curricula suggest that sectoral employer associations can be especially effective in developing and disseminating information for a wide range of firms. At the same time, of course, it is crucial to pursue broader measures to reinforce the capacity for successful local experiences to be reproduced and given institutional continuity.

4. Our case studies do suggest that goals that both manufacturing and service firms must achieve through their training strategies are quite similar. The two sectors differ in the extent to which they have achieved those goals.

The general trends in the global economy we outlined earlier place pressures on both manufacturing and service firms to become organizationally more flexible and more innovative. In services,

preserving a firm's viability in the marketplace requires keeping its service offering at the cutting-edge of demand. Service technology is fundamentally organizational technology, something that is very hard to defend against competitors, and something that can easily be stolen away from the firm. For today's service firm, the challenge is fundamentally one of creating organizations in which information, especially relating to market changes, can be used through appropriate feed-back mechanisms to assist in a continuous transformation of the firm's markets and strategic objectives.

In manufacturing the production technology may be even more widely available to competitors. In textiles, for example, almost all advanced production equipment is available for sale on the open market. Thus manufacturers must not only develop feedback mechanisms that can help the anticipate and adjust to market shifts, but they must compete through continuously improving the effectiveness of equipment that is also available to their competitors.

In short, the challenge in both sectors is to create an innovative environment. This challenge is hardly distinguishable from that of creating a learning environment, that is environment in which each and everyone has an incentive to discover, learn and push ahead.

But while the ultimate training objectives may be the same, in general, service firms, especially fast-growing advanced service firms, have gone beyond most U.S. manufacturing firms in

integrating training with organizational strategies. Indeed, the educational reform movement and the accompanying criticisms of the country's educational system has diverted some attention away from the failures of manufacturing management. Throughout the 1980s, an influential line of argument has maintained that, as the title of a well-know article suggested, we are "Managing Our Way To Economic Decline."[16] Although many analysts continue to argue that U.S. manufacturers are outmanaged by foreign competitors, since the publication of A Nation at Risk in 1983, much of the country's relative decline in international markets has been blamed on the inadequacies of the U.S. educational system and the insufficiencies in basic training of shop-floor workers.[17] [18] Of course, we do not mean to imply that U.S. manufacturing competitiveness would not be potentially strengthened by significant educational reform, but it has not been shown that at the current time, educational weakness of

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[16] Robert Hayes and William Abernathy, "Managing Our Way to Economic Decline," Harvard Business Review (July-August 1980), pp. 67-77.

[17] This is a central point of the Piore and Sabel (op. cit., 1984) book which argued that business practices in other countries were more suited to contemporary market conditions. Much of the management failure line of argument is summarized in Robert Hayes, Steven Wheelright, and Kim Clark, Dynamic Manufacturing: Creating the Learning Organization. New York: The Free Press, 1988); and a flood of books have appeared throughout the 1980s pointing out the apparent superiority of Japanese manufacturing management practice.

[18] National Commission on Excellence in Education, A Nation at Risk: the Imperative for Educational Reform. Washington, DC.: U.S. Government Printing Office, 1983.

production workers is the major barrier to a strengthened economy. Perhaps the best evidence of this is the success that many U.S. firms in services, and even in manufacturing, have had in restructuring despite the apparent educational deficiencies of their workforce. A strong emphasis on broad and comprehensive training is almost always a characteristic of successful restructuring efforts. Moreover, it is not clear that those manufacturing firms that maintain more traditional management strategies would know how to use a more sophisticated workforce. There are certainly examples of retrained workers who have returned to their plants only to be used in the same old ways despite their new skills.

Thus the education and retraining of management remains perhaps the most fundamental training issue in manufacturing (although in services the managers of S&L's could use some retraining as well). As we shall show in the textile case study, the effect of the legacy of a previously successful mass production manufacturing strategy in an era of highly fragmented, diversified, and rapidly changing markets itself creates rigidities in the organization of production that in turn limit the potential contributions of workers. Manufacturing managers must first be convinced of the need to integrate training with organizational change before they can develop a comprehensive approach to training.

II. Banking

Considerable public attention has recently focused on the apparent inability of major banks to find in the labor market the numbers and the kinds of entry-level bank employees demanded by the new banking environment and on the resulting efforts by some of those institutions to help improve basic skills training at the high school level and strengthen school-work linkages.[1] Yet the human resources implications of recent restructuring in the banking industry are much more far-reaching. Rapid market changes, the intensification of competition, and the increased pace of technological changes are shifting the balance of employment growth toward more upper-level personnel and are placing increasing pressure on banks to embrace retraining at all levels. While it remains the case that many banks have yet to develop the resources needed to both upgrade the skills of their workforce and achieve the overall organizational flexibility that is crucial to future competitiveness, some have done so and have strengthened their market position in the process.

This section outlines the major transformations taking place in financial service markets and argues that these changes are resulting in a shift within firms away from the "production" of services (back-office functions) toward customer assistance,

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[1] See, for example, the American Bankers Association, Survey on Basic Skills in Banking (American Banker's Association, Spring 1989).

sales, and product development (front-office functions). The resulting reorganization of the division of labor is characterized by decentralization of both functions and decision-making responsibilities. Such reorganization in turn requires substantial upskilling of the labor force, with a new emphasis on skills related to customer service, sales, entrepreneurship, and high level expertise. Thus social and communications skills become increasingly important for all bank workers, even at the entry level, and employees' abilities to learn quickly in order to adjust to new products or the penetration of new markets become central to firms' competitive strategies.[2]

Financial services and the transformation of markets.

Competition in financial services markets has intensified sharply since the mid- and late 1970s. A catalyst for this change was the growing saturation of traditional financial services markets in the 1970s. No longer able to expand by simply adding new customers, banks and other financial service firms began pursuing a growth strategy based on cross-selling and

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[2] The findings are based on interviews of senior managers, training personnel, and other staff in several U.S. banks, including several large multinational banks with highly developed commercial and retail banking operations; several regional banks; and one multinational bank that has recently shifted from commercial to investment banking. Other banks studied for comparative purposes were in Sweden, West Germany, France, and Japan. Findings regarding changes in skill needs and training in the U.S. and these other countries are discussed in greater detail in Olivier Bertrand and Thierry Noyelle, Human Resources and Corporate Strategy: Technological Change in Banks and Insurance Companies (Paris: OECD, 1988).

the diversification of products sold to customers. Changes in retail banking conformed closely to this trend. The proportion of the population in advanced countries with checking and savings accounts increased rapidly and stabilized at very high levels, leading banks to drastically expand the number and variety of banking products offered to consumers.

The mid-1970s also inaugurated a period of "disintermediation" in the financial services. This trend entailed a shift by bank customers out of traditional financial networks and a search for alternative institutions to fill the same functions. In commercial banking, the shift brought a move by customers away from traditional bank borrowing and toward the commercial paper and the bond markets for short- and long-term funds. In retail banking, consumers looked for alternatives to low-paying savings accounts, and they increasingly substituted other types of investments with higher yields, such as money market and mutual funds. By the late-1970s, standard options included accounts at brokerage firms that unified brokerage, savings, and credit card functions. Disintermediation thus brought commercial, investment banks and even insurance firms closer together and blurred the traditional distinctions among demand deposits, savings deposits, and investment funds.

Banking deregulation, or liberalization, facilitated these changes while at the same time intensifying competition and leading to new practices in banking. Lifting pricing regulations for depositors narrowed the interest spread for lenders and

spurred a search for new sources of profits, such as new charges to account-holders for services formally performed free. Product deregulation spun a few key efforts to link financial services to other sectors (for example, Sears' and J.C. Penney's experiments linking retail and financial services), but the more widespread effect was diversification within the financial sector: for example, commercial banks would now routinely offer depositors access to mutual funds.

Paralleling these changes there was a geographical expansion of banking markets. Many "local" retail banks spread to other states. The internationalization of capital markets and wholesale banking markets, meanwhile, changed the rules for international competition. European (especially British) and Japanese banks entered the U.S. regional banking market serving mostly retail customers and small and medium-sized corporate customers. U.S. wholesale bankers, at the same time, made inroads in European markets in Electronic Cash Management, foreign exchange, SWAPs, and other areas in which they have maintained a competitive lead.

These changes in markets have been closely related to new developments in banking process technology. Although information technologies have long been central to banking, the late 1970s brought a significant development, namely the introduction of distributed data processing and its application to virtually all phases of the production of banking services, from back-office recording of transactions (an early application), to cost-

accounting (widely automated by the early 1980s), to front-office, customer-related services (also largely a phenomenon of the 1980s), to the development of so-called expert systems (for example, "program trading"). It is worth noting that U.S. banks often took the lead in developing computerization throughout a broad range of applications. As already noted, they introduced early electronic cash management applications for corporate customers. They were also aggressive in promoting front-office applications; any retail customer in the United States can confirm the widespread use of on-line terminals for tellers, computer access for customer service representatives, automated teller machines (ATMs), and home banking options.

Paralleling the spread of computerized process technology banks have placed a growing emphasis on using new technologies to develop new products. These changes have contributed to shifting the emphasis towards front-office functions. For example, by organizing data bases by customer rather than by product, banks can produce integrated statements including all account information. Such enhanced product allows customers to shift funds more easily from one type of account to another. But it also gives banks new means to target consumers for the sale of new products.

Both market changes and new technology applications thus encourage banks to shift away from a narrow emphasis on rationalizing production and towards one in which rationalization of production and the accompanying gains in efficiency,

productivity and cost savings are combined with a new focus on diversifying product and improving quality of service, particularly through strategies to improve customer assistance, sales, and new product development. How firms organize to meet this challenge has crucial implications for training of bank employees.

Internal reorganization in banking

U.S. banks have adjusted to the new market conditions in part through decentralization, both of functions and of decision-making responsibilities. The extent and pace of organizational decentralization seem to have varied substantially, but several patterns are clear. First, the technological adjustments described above have permitted decentralization of many back-office functions, such as loan processing and account transactions, by rapidly expanding the number of terminals used by front-office staff. Second, actual decision-making about credit allocation, marketing strategies, and daily management have been extended to branches or to management units overseeing a group of branches so that these could be more responsive to local markets.

Both trends have created certain tensions within banks, at times pitting newer managers against those schooled in the more centralized organizational pattern. Such tensions sometimes have combined with other firm-specific characteristics to slow decentralization substantially. In other cases, the experiment

has been quite bold. One U.S. multinational bank created a structure whereby business managers run their divisions or subsidiaries as independent divisions, defining their own strategic objectives, carrying on independent relationships with suppliers, making decisions about funding of assets and investment of deposits, and keeping records of costs and revenues. Oversight by top managers was not lost, of course, but, too, had to be reorganized. A system-wide committee was established to insure, whenever necessary, technological compatibility among the various divisions. More importantly a system of rigorous monthly financial reporting as well as quarterly strategic planning reports for each unit was introduced, combined with rigorous corporate oversight to insure that each unit performed adequately.

Parallel to decentralization has been a tendency to redefine jobs and reshape the division of labor. Broadly speaking, these changes have entailed a shift away from Taylorism--atomization of the work process into discrete, easily controlled phases handled by different workers--and toward recombination of tasks and a more integrated approach to work. The change has been closely related to other strategic moves. Decentralization, and attempts to target local markets more specifically, has meant that workers more often than in the past must both understand banking functions better and exercise greater control over them. Employees are being called on, after all, to make decisions about

wider sets of transactions and services and to engage in more direct contact with clients and customers.

The effects have been clearly apparent in the organization of retail branches. In the past, the traditional organization of work in a bank's branch would have shown a distinction between front-office and back-office activities (the former dealing with customers, the latter with transaction processing); among front-office activities, distinctions between the activities of tellers or cashiers (in charge of executing withdrawal and deposit transactions for customers) and those of platform clerks (account opening) or assistant managers (special inquiry); and among tellers, distinctions among those responsible for various types of operations (e.g., checking accounts, savings accounts, etc.). While early applications of computer technology probably reinforced the approach of trying to rationalize work for each of these tasks (with specific software, for example), this strategy gave way after the mid- to late 1970s to an attempt to integrate functions and permit more flexible responses of workers to customer requests for different services. In U.S. bank branches, the reorganization took the form of breaking down the distinctions among platform jobs while maintaining the division between platform and teller positions. Also, whereas the traditional avenue for upward mobility in retail banking had once been from teller, to senior teller, assistance branch manger and manager, with the shifting emphasis to service, assistant branch managers are now groomed from the ranks of platform personnel.

That such a solution is not technologically determined is clear when looking at retail reorganization in other countries. In Sweden, for example, commercial retail banks have tended to follow the same pattern of transformation involving keeping a separation between platform personnel and tellers. Yet in the Swedish postal banking system, customer assistance functions akin to those handled by platform personnel in the commercial banks are handled by the tellers themselves. Similarly, in France, a number of commercial banks have attempted to merge the new platform and teller positions into a single new teller job.

Changes in the division of labor are not unique to branch banking but have taken place elsewhere in banks, where routine processing tasks are being recombined with other functions to allow for more flexible responses to requests for information from front-office personnel and customers.

New skills, and the need for new types of training

The U.S. Department of Labor's Bureau of Labor Statistics (BLS) projects a pattern of occupational change in the financial sector consistent with that predicted for the services as a whole. Essentially, the projections are for employment growth to be most rapid in managerial, professional, and technical occupations, but largest, measured by the number of new jobs, in what tend to be regarded as relatively low-skilled occupations (cashiers, janitors, office clerks, etc.). In the financial sector, this pattern is already apparent in employment shifts

between 1976 and 1985, when managers, professionals, and sales staff grew as a proportion of total employment, but where clerical workers continued to account for the largest occupational category, at over 40% of the work force (see Table 2.1).

Such projections tell only a small part of the story, however. They reveal virtually nothing about the transformations within various occupations. In the case of banking, there is a clear basis for arguing that the occupations traditionally viewed as low-skilled are being changed in ways that make them increasingly demanding. Not only will many "sales" and "clerical" workers, for example, have to have better training on entering the banking work force, they will also have to be better prepared to train continually on the job in order to keep up with increasingly rapid changes in products.

The organizational shifts we describe above have as their counterpart the need for new competencies of workers. Some of these competencies are needed now of virtually all workers, while others are quite specific and vary by level.

Broad competencies include the worker skills needed to adjust to the new, less structured workplace and to perform new, more variable tasks in a more flexible way. The new competencies can be summarized as follows:

(1) Ability to adjust to change. The rapid transformation of markets, products, and technology necessitates

relentless redefinition and recombination of tasks, as well as changes in the nature of those tasks.

(2) A more abstract understanding of banking operations. Most workers can no longer rely simply on knowledge of concrete operations since variations on standard tasks are increasingly common.

(3) Ability to make decisions and formulate solutions that can meet the unique demands of customers.

(4) Better communication and social skills. Employees are called on more often to explain, negotiate, and document independently managed transactions.

(5) Improved understanding of system organization. Employees increasingly need to access information that originates and is stored outside their own branches and divisions, and they therefore need to understand more about the relationships among various banking departments and functions.

The need for these competencies extends to both lower and upper-tier workers. Managers report that basic skills problems are most troublesome among tellers, bookkeepers, customer service representatives, and secretaries. The most prevalent type of basic skill problem reported is poor communications, followed by general problem solving, math or computing, and reading comprehension.[3] Changes in skill needs among upper-tier workers

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[3] American Banker Association, Survey, op. cit., 1989.

are just as striking as they are among lower-tier workers, and they are perhaps ultimately even more important for promoting firm competitiveness. Upper-tier workers tended in the past to be trained as generalists capable of managing and coordinating functions of various well-defined departments or divisions. Increasingly, high-level workers must, in addition to grasping the wider, and changing, relationships among departments, have specific areas of expertise that complement the skills of operating managers. The latter, in turn, are finding a shift in their jobs away from administration and control, and toward more complex tasks involving strategic planning, communication with subordinates, including growing responsibilities for proper training of their staff, development of the human resources of their department, and the crucial function of relaying information about market responses and product design to top managers.

Lower-tier workers were formerly characterized by mastery of specialized skills and routine performance of specialized tasks. They are particularly affected by the proliferation of contacts with customers and the need for a wider array of skills used in sales, information gathering, and problem solving. Lower-tiered workers will see a continuing shrinking in the need for low-skilled clerical workers and a progressive blurring of the divisions between their jobs and those of middle-level employees.

In responding to the need for new competencies, firms may expand and revise training, but they may also seek to alter their

relationship to the external labor market and, through replacing personnel and altering entry requirements, seek to place the burden for training outside the firm. The ability to adjust in this way depends, of course, on numerous conditions exogenous to the firms, and this accounts for the very mixed record of U.S. banks in relying on this strategy, an outcome that has placed renewed pressure on firms to focus on improvements in training.

One strategy used with some success by U.S. banks has been to increase the proportion of part-time employees. This has simultaneously permitted targeting of groups with higher levels of education, for example, college-educated women. The use of more part-time employees also fits with a pattern of high turnover that actually helps adjustment by limiting some of the friction that may result when older personnel, used to doing jobs in one way, are asked to adopt to reorganization and new technologies. U.S. turnover rates are high compared to those in competitor countries (see Table 2.2). This has translated into a faster overall upgrading of the work force by level of education completed.[4]

U.S. banks have also made intermittent attempts at recruiting better trained workers by maintaining links to outside education providers. Firms, for example, offer to participate in high school or college programs with the hope of attracting

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[4] For empirical evidence supporting this point, see O. Bertrand and T. Noyelle, Human Resources and Corporate Strategy, op. cit., tables 5.5, 5.6 and 5.7.

graduates with adequate basic skills to retail banking. Such arrangements have emerged particularly in urban areas where retail banks notice a shortage of entry-level personnel with sufficient skills to manage the now more demanding teller and platform tasks.[5] However, these efforts have not been consistently well organized or large, nor have their results been uniformly positive.

One case studied in detail involved a high school program sponsored by Citibank in New York City. The program was designed to give 9th to 12th graders improved basic training together with some bank-specific training and to attract them into clerical banking jobs upon graduation. There were anywhere between 30 and 60 students enrolled in the program at any one time.

For the bank, this new exposure to inner-city high-school education came as a shock. Over one third of the students enrolled in the program dropped out or were dropped because of insufficient literacy skills, poor behavior, or other reason (pregnancy, etc.) Of those that made it through the program, the best graduates tended to move on to college; as for the other, some stayed with the bank, while others sought employment elsewhere. On the whole, this latter group did better in the job

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[5] The American Bankers Association's Survey on Basic Skills in Banking found that between 1985 and 1988, the percentage of job applications turned down because of poor basic skill performance was 5%. The survey also found that the shortage of workers with basic skill was having the most severe impact on teller positions. See the American Bankers Association, op. cit., 1989.

market than a control group that had not benefitted from the program.

The bank discontinued the program after three years, partly because of its high cost (the bank devoted the equivalent of two to three full-time staff to run the program plus student stipends for 11th graders and above), and more importantly because as it decided to relocate several of its large scale back office processing facilities (credit card, travelers check) out of New York, the need for large scale hiring new clerical recruits, which the program was designed to fill, largely disappeared.[6]

U.S. banks' recruitment of entry level workers is somewhat different from that of some of their European counterparts, especially in German banks, that rely heavily on apprenticeship programs to bring in and train new workers. However, the differences should not be overemphasized, since there is evidence that in Europe, too, entry-level requirements are climbing and that formal education is becoming increasingly important as background to apprenticeship training, or for moving on a fast-track after admission to training. Further, it is by no means clear that European apprenticeship systems result in a more effective workforce. For all practical purposes, the French, for example, are abandoning their largely ineffective banking apprenticeship system and substituting in its place a system

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[6] Anna Dutka, "Follow-up and Evaluation of the Citibank--Board of Education--Private Industry Council Office of Technology Pilot Project Program" (Conservation of Human Resources, Columbia University, 1985).

similar to the U.S. system that emphasizes high levels of educational preparation prior to hiring.[7]

High turnover and more selective recruitment are not limited to entry-level ranks but have been used increasingly as well for higher-tiered bank employees. Especially given the increased demand for higher-level workers with specific areas of expertise (marketing, telecommunications, software, etc.), it is not surprising that managers report that there is considerable job-hopping of such workers, to other banks as well as to other industries. Similarly, banks have learned to recruit middle-to-upper level workers from graduate-level (mainly MBA) programs and a more specific range of undergraduate majors; gone are the days when a liberal arts degree at a good university was considered ample training for a middle-rank "generalist."

This overview suggests that U.S. firms are hiring at essentially three levels: at the high school or two-year college level to fill openings in the new clerical and technical positions; at the four-year college level to fill openings in low level professional and managerial positions, and at the graduate school level for executive or high-level professional positions. In some competitor countries, such as Germany, Sweden, and Japan, although traditional hiring practices and current institutional arrangements preserve a greater emphasis on a

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[7] For a discussion of these issues, see O. Bertrand and T. Noyelle, Human Resources and Corporate Strategy, op. cit., 1988.

single port of entry, there is also evidence of a tendency to loosen the tracking system and expand entry ports. For example, the largest Swedish banks have a de facto tracking system for workers of different skill levels, and during the late 1980s a number of the largest Japanese banks have broken radically with tradition by hiring some upper-level specialists directly from the outside. In all cases, of course, changes in the nature and level of recruitment have been insufficient to adjust completely to changing worker skill needs in the new style of banking, and pressures remain strong for expanding and refining firm-based training.

Trends in firm-based training: an overview

Banks, and financial service firms in general, are moving away from an employment strategy of hiring most workers at relatively low levels and then giving them training to develop additional scholastic skills and firm-specific skills. The new model emphasizes the hiring of workers with higher levels of formal education and attempting to refocus much of firm-based training on those skills which are primarily specific to the firm. This splintering of the skill formation process between the formal educational system and firm-based training is often imperfect (as it is in the example given above of entry-level workers whose basic skills are inadequate to allow them to absorb firm-based training). Further, to be effective, firm-based training must often include development of general competencies

of the type outlined in the previous section (communications skills, customer assistance skills, etc.) that are only partly firm-specific or job-specific within the firm.

Thus firm-based training continues to take on added importance both in fine-tuning workers' existing skills and in supplementing their training. The nature of training is clearly changing in response to the demands of the new work place. We have defined four different skill types that are becoming increasingly important in the financial sector in general: new behavioral skills, including social and communications skills; product and markets knowledge, increasingly important as products multiply; expertise in new areas, as high-level specialization accelerates; and new entrepreneurial ability, as units of operations become more autonomous.

New behavioral skills and product/markets knowledge are particularly important in training for lower- and middle-level clerical and front-office workers because of the proliferation of contacts with customers and the increasing importance of product differentiation in maintaining competitiveness. In retail banking, training programs tend to entail both general introductions and practical applications, with trainees put on the floor to observe or practice positions in the latter stages of the training program. At higher levels, training also tends to have a centralized part (run by a personnel or a human resources department) and a decentralized component (in a specific department, division, or unit). In the highly

decentralized multinational bank mentioned earlier, all training is decentralized, and it is further broken down into training in new behaviors and teaching of specific technology- or product-related skills.

There is every indication that, at least in transmitting knowledge of products and markets to employees, U.S. banks have a fairly good record. The success might be partly explained by the new division of labor itself, which acts to aid training by giving workers exposure to a wider array of tasks immediately and helps them develop a clearer sense of the connectedness of bank operations by forcing them to participate in more varied types of transactions. Where the banks have performed less well in training--or where they have at least concentrated fewer resources and less attention--is in inculcating entrepreneurial abilities, in identifying ways to systematize or promote learning that takes place on the job, and in promoting balance between specialized, higher-level skills and broader understanding of banking functions. In part, this strategy has worked up until now because of the more porous relationship between formal training and on-the-job training at higher levels (a greater tendency, for example, for professional workers to take outside courses or volunteer for new training) and a greater ability to learn new specializations on the job among well educated workers. Organizational changes may be working in the banks' favor, too. Upper-tier workers placed in decentralized units are forced to interact to a greater degree with employees who do not share

their areas of expertise and, in the process, they may acquire a better understanding of the place for, and potential of, their own contributions. These findings remain speculative, but we shall try to give them more substance by examining the recent evolution of training in one case.

Training in U.S. banks: A case study

One result of the trends toward internationalization and product competition described above has been a greater specialization of banks themselves as they target narrower, but more rapidly changing, market niches. While some U.S. banks have significantly expanded their retail banking operations, others have curtailed that side of their business and have sought to specialize in wholesale banking, foreign exchange trading, investment banking, and other services geared toward the international market and corporate customers.

One bank which has taken the second route serves as a good case study of the effects of industry restructuring on training. The increased emphasis on serving corporate customers has combined with internationalization of banking operations and the acceleration of technological upgrading to produce a dramatic and steady shrinking of the clerical work force relative to professional jobs. The latter now account for roughly 60 percent of all positions. Even within the clerical ranks, low-skilled jobs are fast disappearing as virtually every aspect of bank work involves the use of some advanced automated equipment and

communicating with client staff. ("We think of every person as being in customer assistance," one trainer remarks.)

Skill needs at higher levels have also changed dramatically over the past decade. The bank used to hire entry-level professional staff whom they thought of as generalists to work as generalists, supervising departments or acting as loan officers and only moving after many years, if at all, to more specialized posts. Now, however, the market is so product-driven and so varied that new employees must specialize almost immediately, moving directly into units such as mergers and acquisitions, foreign exchange trading, SWAPs, private banking, or other areas. The rapid fluctuation in these fragmented markets and continual product transformation and diversification mean that these workers must also then change specializations frequently. In this new set-up, only a select few will ever "graduate" to becoming generalists, when they will oversee the coordination of various specialized units.

The bank has responded to these new needs by altering both recruitment strategies and training. Both adjustment strategies face limits, however. In recruitment, in addition to recruiting for its general young professional track (the "generalists") the bank does hire in special tracks a growing proportion of entry-level professionals (the "specialists") who are already specialized in such areas as systems analysis, accounting, and other areas which both require special skills on entry and project less horizontal mobility for employees later. Language

knowledge and cultural communications skills are different types of special skills that can be taken into account in recruiting, and the entry pool has logically broadened to include a much larger percentage from outside the United States. Finally, the bank has followed others in recruiting a higher proportion of graduates of professional (especially MBA) programs.

Despite these strategies, however, it is clear that changing recruitment practices solves only some of the new problems. What trainers say they want, after all, are not specialized workers, but workers who can learn to specialize more quickly and more often than others. And these faster learners turn out to be generalists. As one official puts it, "We want to hire people who have a general capacity to become specialists, over and over again."

Thus the burden remains on training to introduce employees to firm-specific practices, to educate them about banking functions, and to help them acquire, on multiple occasions, expertise in a specific banking area. The vehicles used for training in the past can be partially adopted for these tasks, but new types of training have to be improvised.

The bank has thus kept the shell of its traditional training program for most new professional recruits, but altered it substantially. The specialists who are hired as specialists attend different training programs in their particular areas (systems design, accounting, etc.). But "generalists" go through a basic full-time training program that lasts three to four

months and is entirely based on classroom work. During the 1980s, this program has involved anywhere from a low of 150 to a high of 300 new recruits per year. Despite its high cost, bank officials find this program indispensable because it gives workers an intensive introduction to firm-specific practices and creates social ties among workers that later turn into crucial intra-unit social ties. It is an important building block in inculcating a strong sense of company culture to the new cadre of young professionals and managers. One important change in content is the elimination of work experience as part of the formal training (there are very few low level tasks left for trainees to do in a unit before they are ready to be "thrown in" to their jobs); another is the increasing reliance on line management instead of outside lecturers to give training in specific areas. The latter change reflects the increased emphasis on product and on firm-specific practices. Another change, consistent with the growing emphasis on training specialists, is the departure from a single-track training curriculum in which every "generalist" was trained in the basics of "commercial lending"--risk analysis, risk assessment and so forth. Indeed the bank has little use for such "generalists" since nowadays it does very little traditional commercial lending.

Perhaps the most interesting adjustment in training that has taken place in the bank involves the increasing need for various types of ad hoc training to prepare employees to handle new

product lines. For example, when the bank committed itself to a major shift from commercial to investment banking, it organized a course for current employees that focussed on the basics of investment banking. It was given only twice to a total of 2,800 employees and was never offered again. Similarly, individual units often organize training for their own personnel when a need arises; the training may begin informally, with several minutes of a meeting devoted to teaching about a new product or technology and expanding gradually into a formal course involving several days of classroom training and bringing in, if needed, outside trainers. There is much greater capacity than in the past for decentralized types of training, and greater recognition on the part of officials that the organization's ability to be flexible in its approach to training is an integral part of its competitive strategy.

Interestingly, bank officials also stress that one result of these changes has been a continual blurring of the boundary between training and on-the-job learning. Trainers cannot themselves identify for the most part how or when specialists require their expertise, but they have found that effective learning is more likely to happen when jobs are "kept interesting." This can also be achieved in a variety of ways: through frequent rotation of employees to new units, through involving workers in product development, and through technological upgrading itself, as workers are motivated to learn new skills through a desire to "play with new toys." Yet, while

trainers extol the importance of informal training and self-learning, they admit that the bank has placed relatively little emphasis on identifying and generalizing those work structures and relationships that seem most conducive to creating a learning environment. One might speculate that creating a learning environment is tantamount to creating an innovative environment, i.e. an environment in which new ideas are regularly brought to market. While the bank is clearly one of the most innovative in the business, this observation by its trainers would seem to suggest that this bank has yet to understand fully how innovation comes about in banking and, perhaps, has yet to muster its own full potential for innovation.

In addition to the relatively centralized entry-level professional training track and the highly decentralized, ad-hoc training and on-the-job learning taking place in the business units, the bank has a management and professional skills curriculum available to professionals with several years of employment at the bank. Candidates to the program are selected through joint agreement between the individuals concerned and senior management. The aim of the program is to train future senior managers. The program is organized at the corporate level and emphasizes skills needed by the heads of units: supervisory skills, for internal communications; and writing, client presentation techniques, and other skills needed in external communications.

Together, these different layers in the training/learning system have made for a system that is both centralized and decentralized. One official drew a parallel with the configuration of the bank's computer systems involving layers of PC based systems, mini-computers and mainframe: "All levels are needed. They must fit together. And yet the relationship among them must also change as needed."

While we can clearly say, then, that improving and refining training has played an important role in this bank's drive for international competitiveness, it is also true that changes in training are inseparable from other adjustment strategies, especially organizational changes (from generic department to product-oriented units), new recruitment policies, technological upgrading, and a restructuring of work to make jobs less routinized and more closely responsive to clients. Although the bank is in no sense representative of all banks, its experience does underline some general findings.

First, it demonstrates considerable agility in adjusting rather rapidly (in a decade or less) a training system that was suited for one kind of banking environment to a very different environment. And contrary to the often-held view that U.S. firms are unable to think long-term, the magnitude of the transformation needed to bring--in this case, quite successfully--such a large institution from the old commercial to the new investment banking environment suggest both that considerable strategic foresight was exerted by senior management and

considerable resources were invested to bring the human resources in line with the new need. To add if only a modest example to this discussion, the perception that the bank would have to become increasingly internationalized to compete and that true internationalization of the bank would necessitate internationalization of its senior personnel was recognized 20 years ago. At that time the bank started enforcing a vigorous program to recruit large numbers of non-U.S. professionals and managers, so that, today, nearly half of the company's senior executive staff are non-U.S. citizens. Other large U.S. banks started moving in the same direction back in the early 1970s. This achievement must be compared to the relatively stagnant management profile in the largest Japanese or French banks, where foreign senior managers simply are not to be found.

This case study also illustrates the point that product- and technology-specific training increasingly belongs in the firm rather than in formal degree-granting programs. The latter could never keep up with the pace of change nor prepare workers to handle increasingly firm-specific products.

Finally, the bank's experience underlines the potential for improving training through measures that are not training specific but are built into jobs. Yet, it also reminds us of how little we know about how to generalize techniques that both facilitate organizational flexibility and maximize individual learning.

Table 2.1
Occupational Structure in the U.S. Financial Sector
1976 and 1985

Worker categories	1985	1976
Managers and professionals	27.5	25.2
Sales	24.0	21.5
Clerical	41.1	44.3
Service Workers	3.9	5.2
Blue-collar workers	2.4	3.8

Source: U.S. Department of Labor, Employment and Earnings, January 1977 and January 1987, from O. Bertrand and T. Noyelle, Human Resources and Corporate Strategy, op. cit.

Table 2.2
Turnover and Employment in Eight Banks
1980 and 1985(a)

	Hire rates(b)	Employment	
		1985	1980
U.S. multinational bank			
Domestic	n.a.	32,300(1983)	n.a.
North American consumer banking group	23.0	n.a.	n.a.
U.S. regional bank	15.0	3,627	3,731(1981)
Japanese Money Center bank			
Full-time only	7.8	15,836	n.a.
Swedish bank	4.7	7,931	7,231
German savings bank	5.5	1,182	1,168
Large German bank	4.1	24,154	n.a.
French regional bank	2.8	10,268(1984)	10,295(1982)
Large French bank (regional district only)	1.3	909	932(1983)

(a) Both sexes and full-time workers combined.
(b) New hires as percent of total employment.

Source: Company data. O. Bertrand and T. Noyelle, Human Resources and Corporate Strategy, op. cit.

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III. The Textile Industry

The transformation of markets and other broad changes in the economy since the mid-1970s have had a profound effect on the textile industry in the United States. While the number of styles of textile products has expanded dramatically, international competition has also intensified. Most U.S. firms entered the new, more competitive era with plants organized according to traditional mass production models: Large, mostly unskilled work forces performed routinized tasks at fixed locations in the mills, manipulating mechanical machinery and performing the heavy manual work required to move the raw product from one highly mechanized production phase to the next. Not surprisingly, this structure did not rapidly devolve into the more decentralized profile of textile industries found in some competitor countries. Instead, firms responded with a mixed strategy of much greater investment in modern technology, increased specialization in particular market segments, reorganization within vertically integrated firms to enhance quick response to customer orders, and the development of more interactive relationships among supplier and customer firms.

These adjustments have all implied changes in the way employees are trained. The nature of some tasks has changed substantially, and many more jobs require at least literacy and a mastery of basic arithmetic. Workers must also interact more often and in new ways on the job, both with each other and with

managers. Traditional patterns for internal promotion have been disrupted at the same time that more value has been placed on employees' knowledge of the wider production process. Unlike some of the other sectors we discuss in this report, the industry has not been able to rely heavily on recruiting a different, more educated and better trained work force, and it has therefore been forced to concentrate on upgrading the education and skills of existing workers. Training has become a much more prominent part of firms' overall competitive strategies.

Before examining in detail current trends in training, we will outline the major shifts in the industry's competitive environment. Adjustment strategies other than training--investments in technology, reorganization of production, and recruitment strategies--deserve attention since each of these changes had the effect of both altering training content and creating new training needs.[1]

International and national trends in textile production

The U.S. textile industry faced three sudden and profound shocks in the 1970s and early 1980s. The first was accelerating competition from producers abroad. The volume of imports more

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[1] Information on textiles in drawn mainly from government sources, trade publications, and interviews with industry representatives and firm managers, including training managers. See Thomas Bailey, Education and the Transformation of Markets and Technology in the Textile Industry (National Center on Education and Employment, Columbia University) Technical Paper No. 2, April, 1988.

than doubled between 1980 and 1988, and by the latter year came to account for over a third of the domestic textile market and over half of the U.S. market for apparel fabric.[2] Some of the increased competition came, of course, from countries with substantially lower labor costs, such as East Asian producers, whose share of imports surged dramatically in this period. But the rise in imports also extended to more sophisticated producers who were entering the U.S. market with higher quality, higher fashion textiles: in Japan, Italy, and even England, firms experimented with new products and new applications of technology.

Indeed, the second change affecting U.S. producers was the accelerating pace of style changes. Many U.S. firms had already pursued specialization in relatively standardized products to take advantage of their technological sophistication and economies of scale. Yet even the most standardized products were now becoming highly variable. Market segmentation and differentiation clearly responded to parallel trends affecting the garment industry, with its faster changing seasons and shorter production runs. Customers began to demand relatively standardized products such as denim or the simple cotton cloth used for underwear and sheets in dozens of weaves, colors, and finishes. Meanwhile, the share in consumer markets of products using the standard materials declined steadily. Clearly, firms

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[2] Unpublished data provided by the American Textile Manufacturers Institute.

could no longer rely exclusively on their ability to produce large quantities of a narrow range of goods.

Third, after several decades of relatively stable technology in the textile industry, producers encountered newer, faster versions of textile machinery on the market: air-jet looms, for example, that could weave at four times the pace of the traditional shuttle looms. Applications of computer technology also promised a revolution in the ability of managers to monitor the production process by tracking the flow of product through mills. Micro-electronic controls could be incorporated into the new machinery, enhancing precision and improving quality control for particular steps of the production process while facilitating tracking and inventory control.

U.S. firms' responses to these developments have been, logically, to build on their existing strengths and work around the limitations built into the highly integrated, mass production structure that characterized most firms before the 1970s. Predictably, too, the results have been mixed. While some firms have emerged in a strong position in world markets for a range of specialized products--for example, denim, industrial fabrics, and textiles for home furnishings--the industry as a whole has experienced cut-backs in both employment and output. While the U.S. textile <u>market</u> grew by 16 percent between 1980 and 1988, production in the U.S. fell by 11 percent. Domestic employment decreased by 14 percent in the same period, reaching 729 thousand in 1988, a striking contrast to its level at 965 thousand in

1974.[3] Many firms closed, leaving survivors who had managed to adjust to meet the new market conditions, and many of these firms began to show healthy profits. Employment rebounded in the second half of 1986 and corporate profits on sales were also on the rise. Yet, the conditions that shocked the industry earlier have not disappeared. Imports continue to go up at a rapid clip (about 15 percent per year) and pressures for product innovation and diversification continue to grow.

Let us take a closer look at the strategies of these firms and the implications of their approach for training.

Technology and systems of production

It has become commonplace to assert that the textile industry in the United States has become more "market driven," but it is also clear that more than one pattern of production and mix of technology could respond to this new environment. Case studies of the textile industry outside the United States have shown the capacity for highly decentralized industries to combine technological sophistication with high flexibility through the emergence of subcontracting webs linking various phases of production. Such a pattern has emerged, for example, in central Italy, where vertically integrated firms disappeared in the 1970s. Newly created, small specialty firms proved to be highly innovative in both technology and product design, and they have

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[3] American Textile Manufacturers Institute, Textile Highlights (September 1989) Table 22.

played an important role in the industry's continued competitiveness.[4] In Japan, small firms and decentralized production contributed to the dynamism of the textile industry in a different way. Very large firms in the highly concentrated spinning industry traditionally used tiny family-owned firms to weave the yarn into fabric. This structure helped those firms adapt to new market conditions in the 1970s and 1980s.[5]

The U.S. textile industry, in contrast to these examples, was not a likely candidate for productive decentralization. To begin with, a strong tradition of small, family-run industrial firms was lacking in most textile-producing regions. In fact, U.S. textile firms had adjusted in the past to lower cost competition largely by moving to lower-wage, relatively union-free areas, where most employees lacked both the skills and capital to form subcontracting firms.[6] Furthermore, firms found too that in some lines they could continue to compensate for rising wages by increasing productivity.

Indeed, the first and clearest strategy of U.S. textile producers was to increase significantly investments in machinery and automation. In a list of U.S. industries ranked by the age

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[4] See Charles Sabel, Work and Politics (Cambridge: Cambridge University Press, 1982), Chapter Five.

[5] Ronald Dore, Flexible Rigidities: Industrial Policy and Structural Adjustment in the Japanese Economy (Stanford: Stanford University Press, 1986).

[6] On the parallel shift in the U.S. apparel industry, see Roger Waldinger, Through the Eye of the Needle (New York: New York University Press, 1984), Chapter 1.

of their equipment in 1960, the textile industry rated forty-eight out of 61 manufacturing industries; by 1980, only one industry had, on average, newer equipment. The wave of modernization affected virtually all the steps in the production process. Computerized machines were introduced to pick up raw cotton entering the mills and distribute it through chutes to automated carding machines. New technology revolutionized the next step, where the introduction of "open-ended" spinning drastically increased productivity and helped to eliminate costly steps of maneuvering materials, loading and unloading, and adjusting machinery for different fiber and yarn types. The new shuttleless looms made weaving significantly faster, improved efficiency, and produced higher quality cloth. Similar gains in productivity were possible with the introduction of new types of knitting machines. In addition, a range of smaller innovations affected even the most mundane tasks of the textile plants. Much of the heavy physical labor needed to move materials from one production stage to another, or to clean the loose fibers and threads that are inevitable by-products, was eliminated when new investments were made in relatively simple machinery (in lifts or suction tubes, for example).

The result of heavy investment in equipment was not surprising. Productivity in the industry grew by 5.0 percent a year between 1975 and 1987, compared with 2.8 percent in total

factor productivity in U.S. manufacturing.[7] In many ways, the investments were supportive of a broader strategy by U.S. firms. Unable to compete successfully with either the cheaper apparel fabrics coming from East Asia of the higher quality, fashion apparel textiles from advanced competitors, U.S. firms began to specialize in product segments where their capital-intensive, vertically integrated plants could be an advantage: more standardized apparel fabrics, home furnishings, and industrial fabrics. The last two categories accounted for 52 percent of U.S. textile production in 1980, 60 percent in 1985, and 63 percent in 1988.[8]

Within these specialized categories, firms also began to strive to produce a wider variety of fabric, and most are doing so. One spinning mill we visited had increased the number of active styles from three to 35 in two years, and a plant producing home furnishings now made 300 instead of 100 styles annually. Denim manufacturers, too, began turning out dozens of styles when only ten years ago they had produced only a few.

However, the emphasis on modernization itself has created some new obstacles to achieving greater flexibility in production. The production process has always been somewhat resistant to frequent change. Because the process involves moving bulky materials through a fixed set of production steps,

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[7] American Textile Manufacturers Institute, op. cit., Table 21)

[8] Unpublished data from ATMI.

changes can often not be made without completing the batch already underway; then other steps are necessary, such as cleaning the equipment thoroughly and making adjustments to load new material. Since adjustments are usually necessary at every step in the production process--blending, spinning, dyeing, and weaving or knitting--frequent changeovers require a much more refined supervisory function and closer attention to coordinating the timing of each phase. The danger is that some machinery will sit idle while adjustments are made, thus increasing variety of product at the cost of lower productivity.

The costs of idling the newer, more expensive equipment are clearly higher. Shuttleless looms, for example, increase speed and eliminate some tasks, but they have little effect on the time required to change loom functions, so they may actually increase incentives for larger runs. The effect of the new machinery on flexibility may be similarly mixed. For example, high-speed open-ended spinning promotes flexibility by substantially reducing the work involved in switching materials, but at the same time it limits the range of products that can be made because only coarser, heavier yarn can be used.

Overall, the new equipment has a further, built-in limitation; namely, it represents a one-time improvement in production. Even the most aggressively modernizing firms cannot plan on replacing the costly equipment often. Indeed, there is some evidence that the competitive strategy based mainly on new

technologies has now run its course and that U.S. producers are looking to other types of adjustments.

Quick response and organizational change

The development of production systems dedicated to "quick response" is a hybrid case of technological and organizational adjustment: based on the use of micro-computer technology to monitor production flow, the strategy also entails changes in the way production steps are linked. While computers have had relatively little impact on the actual production process, they have revolutionized manufacturing control, planning, communication, and record keeping. The goal of quick response is to utilize this capability to minimize the time between receiving orders and delivering goods to customers. The process used to take many months, but the greater sensitivity to fashion and faster pace of fashion changes have made the long lag time too risky to customers. Quick response was designed to allow retailers to order only small quantities at the start of the season and reorder popular styles after the season has started. Beginning in 1985, U.S. producers recognized that this strategy would be key to their competitiveness. Their closeness to U.S. customers would further pare delivery times and give them an advantage over foreign producers.

Perhaps the most revolutionary aspect of this development involves changes in the relationships between textile manufacturers, apparel makers, and retailers. Previously these

relationships were often adversarial and many times managed by middlemen. Thus "converters" bought textiles from mills in the south and sold them to New York garment makers. This not only multiplied the time necessary to produce and deliver the goods, but thwarted the exchange of information between retailers and the producers in the various parts of the supply line. Indeed it was often in the interest of the middlemen to control and limit the communication between their suppliers and customers. The quick response strategy has now lead to the creation of a framework for more interactive and direct relationships between suppliers and customers. For example, many textile makers have drastically reduced the number of yarn suppliers that they use. Rather than going to the market each year to buy the cheapest yarn, they have moved towards developing long-term relationships with a small number of suppliers with whom they can work closely and exchange information and ideas.

But so far, the strategy has entailed mainly changes to minimize inventory held by both retailers and manufacturers. Ideally, retailers trigger new orders when inventory falls below certain levels. Reordering would of course be fastest if manufacturers held inventory, but the purpose is to reduce the risks of stocking goods for which new demand never materializes. The pressure, then, is to fine-tune production schedules and minimize delays so that orders can be moved through quickly. Computer controls on equipment can be used to aid this process by tracking product flow.

While many U.S. producers have enthusiastically adopted some version of quick response, they have had to work around certain rigidities in the way production is structured in the plants. For example, some firms have reduced final inventories but still must stockpile quantities of partially finished material along the production route, thus limiting the range of fiber blends and even colors that can be used for finished products. Quick response has thus worked best in firms that still concentrate on a relatively specialized range of goods--denim producers, for example, or makers of certain types of fabrics for home furnishings.

The current challenge of the industry is to break down these rigidities and bottlenecks to create a production process that itself is more flexible and responsive, and as we have seen, new technology alone cannot provide that flexibility. As a result, some firms have also instituted changes in internal organization. The traditional organization by functional department worked best when firms produced only one product or at least produced a small number of products in large runs. As styles increased, some plants began to restructure into product-specific departments in which all the production stages could be carried out. By some estimates, as early as 1987 as many as a quarter of U.S. textile firms were experimenting with new ways of structuring the division of labor. The experiments typically involved efforts to make workers' tasks less rigid and to enhance cooperation of workers in a given production area, either by organizing workers

into teams or by rewarding all workers or whole departments, rather than individuals, for increasing productivity. These systems allow for greater flexibility and faster response.

Changes in work and skills

Modernization and the introduction of quick response have had an immediate effect on the nature of work in the textile industry. Although new equipment often reduced the number of workers needed for particular stages of production, remaining workers were found to need a different mix of skills. Operators jobs changed, technical jobs became more difficult, and all positions assumed a different relationship to the jobs around them. The implications for training are vast.

In traditional textile mills, operators carried out one or a small number of repetitive tasks. Because the technology of the plants had changed little in several decades, many employees had worked in a relatively stable environment for years. The promotion ladder in the plants typically led up through the ranks of one department. Thus a worker in the spinning section, for example, might start out as a cleaner and eventually become supervisor of the section. The tasks of the workers below him would have changed very little and, whatever his level of formal education, his experience on the job would serve him well in overseeing their work.

In the 1980s, this panorama changed considerably. Both operators' and supervisors' jobs have become more complex and

more demanding; mastery of a particular production phase is no longer a sufficient qualification for promotion; and new types of technical jobs requiring more skill than earlier maintenance jobs have been created. Many of the jobs that involved simply heavy manual labor have been eliminated, and the overall proportion of operators in the labor force has declined. By 1985, there were only 3.5 operators, laborers, or service workers to very craft and technical worker, compared to a ratio of 4.2 to one in 1975.

Consider the effects of plant modernization on operators' jobs. Although new equipment has reduced the number of operators needed, it has also changed the nature of their jobs. In some sense, the jobs have clearly become easier. For example, workers in spinning and weaving less frequently have to knot broken threads, a task that required dexterity and experience. In general, the new machinery relieves much of the responsibility of quality control from individual operators, at least in the spinning and weaving stages. At the same time, however, the new equipment requires a new set of skills from workers. Computer-controlled equipment needs to be reset and have information loaded into it and read from its display. And because the equipment is more expensive than older machinery, errors are also more expensive; workers must help to prevent machine stoppages by understanding more than in the past about the production process and what makes it run smoothly. This implies greater responsibility to make decisions and communicate about problems with supervisors.

The changing organization of work and the increasing pace of technological and product change also affects operators and expands their responsibilities. The new schemes for organizing work also call upon workers to have at minimum a capacity for communicating with other employees and the ability to respond to a more varied, faster changing, work environment. As a result, managers see a much more urgent need for basic literacy and math skills among their operators. Although it is still possible to design jobs for textile operators who have very rudimentary basic skills, this requires much more direct involvement from the supervisors. Such workers must be shown by supervisors how to make even small changes in products or processes. In contrast, literate workers can follow written instructions. As one manager stated, "things change much more rapidly now, we don't want to have to show each operator how to do everything." Operators are also being asked to be more involved with diagnosis of problems with their equipment and to record their conclusions on terminals. These types of activities are almost impossible for workers who cannot read or write.

Modernization and changes in plant organization also have an effect on the skills needed by managers and supervisors. In order to coordinate production schedules with other departments--a task that is crucial to the success of quick response--supervisors must know more about the equipment than a typical operator and must also have the communications skills needed to convey complex information about its operation to supervisors in

other departments. Managers, too, need a more sophisticated understanding of production in order to make marketing decisions and contribute to the ongoing task of product innovation.

Perhaps the most noticeable effects on the work force have been in middle-level technical positions. Machinery repair in the textile industry traditionally required a level of mechanical know-how that could be garnered through a combination of tinkering outside of work and informal, on-the-job training. Technicians now must be able to read and understand manuals and other materials provided by the manufacturer. They must often have basic computer literacy and numeracy skills in order decipher computer controls. And, most important, they need to have a broader grasp of the production process if they are to contribute to the goal of preventing rather than simply responding to machine stoppages. These new demands have made the traditional practice of internal promotion of operators to technicians impossible on the basis of old systems of training.

In summary, the adjustments in technology and work organization outlined in the previous section have changed firms' human resources needs and goals. Employees need broader skills: the ability to interact with others, knowledge to anticipate problems a broader understanding of the production process, and the capacity to operate in a more uncertain and more variable environment. They also need higher levels of education. The jobs for which operators do not need at least basic literacy and numeracy are fast declining, while the requirements for some

other jobs, such as those of maintenance and repair personnel, are fast increasing. Not surprisingly, firms have responded with new strategies for training.

New trends in textile education and worker training

A well defined job ladder traditionally existed inside most plants. Unskilled workers entered the mills to do service jobs--cleaning and moving material--before moving into progressively complex operator positions. Those with aptitude and interest could look forward to becoming repair workers ("fixers"), supervisors, or even plant managers. Although some classroom training was provided at large firms, most training was informal. Workers without high school diplomas could progress far up this promotion ladder.[9]

Most firms still have internal posting of openings and make at least a show of trying to recruit from within. But the biggest problem facing firms now, they report, is that they cannot find enough qualified people from within to fill the increasing number of technical jobs. Filling supervisory jobs, although not as pressing a problem, is also a concern since these

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[9] Firms usually recruited college graduates to work as upper level managers or in high level technical and sales positions. When trainees for managerial positions were not family members, they were usually college graduates, often from one of the specialized textile schools with specialized textile programs include the Philadelphia College of Textiles and Science, the Institute for Textile Technology, the North Carolina State School of Textiles, Clemson University, Auburn University, and the Georgia Institute of Technology.

positions too require much more preparation than in the past. In some cases, even keeping operators in existing jobs is difficult after new, more sophisticated equipment is installed.

One strategy firms could employ to adjust the work force to the changing skill requirements would be to alter recruitment policies and bring in workers with higher levels of education. A parallel strategy would be to limit internal promotions and recruit from the outside for the higher positions that now require better preparation. However, U.S. textile firms have faced a much more limited labor supply than the other sectors covered in this report, and they have therefore been much less successful in adjusting the skills of the work force through recruiting changes. The industry is highly concentrated in the southeastern United States, particularly in the smaller cities and towns of Georgia, South Carolina, and North Carolina, where its reputation as low-wage and its past practice of hiring mainly unskilled, poorly educated workers have made it difficult to attract upwardly mobile, better educated southerners without very substantial wage increases. There is resistance, too, from inside firms to breaking up the old internal promotion ladders, which many workers have come to regard as one of the main benefits of their jobs.

Because links to junior colleges or vocational schools were weak in the past, these institutions do not hold much promise as sources of technically trained workers for expanding middle-level jobs. Even by the mid-1980s, few students in the community

colleges were being prepared for technical positions in the textile industry, and almost none were expected to go on to production positions.[10] On the one hand, most community colleges did not keep up with the latest trends in technology in the industry and could not supply narrowly trained technicians; on the other, most graduates continued to look outside the industry, in areas with higher prestige than mill work.

All the plants we visited reported that they are able to recruit very few new workers with more formal education for technical and supervisory jobs. Whether they have wanted to or not, they have had to rely on improving training to refashion traditional internal promotion ladders. Their efforts have focused on three areas: improving basic skills of workers through support for secondary school education or literacy programs; upgrading training to workers through links to community colleges or new types of in-house training; and increasing training done by equipment manufacturers.

Virtually every manager complains about the low quality of basic education received by entry-level workers. In the 1980s, firms have increased efforts to work with local high schools to improve basic education and, more significantly, have instituted workplace literacy programs to teach workers basic skills and

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[10] Of the 75,000 technical-program students enrolled in North Carolina community colleges in 1985-86, only 5,000 were studying for occupations that might be useful for the textile industry, compared to 35,000 who were preparing for office work in the services.

help them to work toward high school equivalency diplomas. Although these programs do not generally represent large outlays of funds by the textile companies in the last two or three years they have aggressively pursued literacy funds from federal and state programs. For example, about 30 percent of all of the federally supported workplace literacy programs in North Carolina in 1988-1989 were in textile companies. Representatives of the South Carolina Governor's Initiative for Workplace Excellence stated in the fall of 1989, every major textile firm in the state had a workplace literacy program. Although such programs do not generally include work-related training, management clearly defines them as an integral part of the training package.

A second, related trend involves upgrading skills of experienced workers. In reorganizing training inside firms to meet the new production conditions, companies have relied on two sources of help from outside: equipment manufacturers and local community colleges.

Many machine manufacturers provide, for a fee, training programs that teach skills highly specific to running their machinery. Textile companies have taken advantage of such programs and have, more significantly, often used the programs as models for developing in-house training for running other equipment. The programs typically last for several weeks and take place at a centralized site. While machine vendors have provided such training in the past, the increase in the sophistication of the equipment over the last decade has made the

vendor courses as well as internal courses to train mechanics more demanding. In particular, good basic skills are essential. For example, the manager of technical personnel in a knitting mill reported that the installation of a new system did require considerable technical upgrading. Nevertheless, while the technical training was expensive, he pointed out that he spent even more on teaching the students the basic skills needed to participate in the technical course.

Some firms have also arranged for upgrading to take place at local community colleges. While the latter have been ineffectual in developing independent programs to graduate trained personnel for the industry, they have been more responsive in developing and running customized courses for the industry or upgrading programs for experienced textile workers. For the schools, such programs bring in students and justify increased state funding; for the companies, the programs provide access to indirect state subsidies for needed training.

Perhaps the best example of this greater communication between industry and community colleges is in North Carolina.[11] The community college system includes the North Carolina Vocational Textile School, which offers two-year programs for

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[11] Schools in North Carolina actually receive less benefit from having the extra students than they would in some other states. Under the current financing system in North Carolina, schools receive less than half as much for a full-time equivalent extension student as for a full-time student enrolled in a degree program. And because full-time enrollment from the previous year is used to calculate current year funding, schools in this state have few incentives to run part-time extension programs.

technicians, one-year programs for machine operators, and extension programs at the mills. The student population more than doubled between 1982 and 1987, and nearly all students are current textile employees. In contrast to most other colleges with textile-related courses, the school has been able to acquire up-to-date equipment and can thus give students both theoretical and hands-on training.

Our research suggests that most textile firms were caught off guard by the new skill and education requirements on workers. Most are still in an experimental stage in forming new training programs, having recognized that they will not be able to adjust the work force through new types of recruitment alone. In-house training programs and arrangements for customized outside instruction differ substantially, but most large firms have in common a more vigorous commitment to helping workers master basic skills and to strengthening technical skills.

Trends in training in the textile industry: A case study

The general points made above come into sharper focus when we examine changes in training in one firm. The company we take as our example is Swift Textiles, Inc., a subsidiary of the Canadian corporation Dominion Textile Incorporated and now the largest denim manufacturer in the world. Swift followed the twin strategies of modernization and internal organization outlined in an earlier section. In March, 1987, the firm announced a $52 million plan to install state-of-the-art equipment, including new

air-jet looms, in its Columbus, Georgia plants.[12] At the same time, the firm expanded the number of denim weaves and colors, stepped up efforts to monitor and anticipate market changes, and moved toward establishing a system of quick response.

The modernization program was the primary catalyst for changing training and introducing a new education program. Even some of the simplest production jobs now required that workers enter information on computer terminals. For example, as the firm stepped up efforts to prevent down-time for its expensive, high-capacity looms, they worked out a system to record the causes of loom stoppages. But the system depended on the ability of loom operators to diagnose the problem and to enter a code corresponding to that problem on the loom's electronic control panel. These codes are listed on a multi-page document. Thus not only must these operators be able to read the codes, but they must be able to make some judgments about the causes of machine problems, not all of which are obvious. As one training manager said, "we are simply asking a lot more of these weavers than we used to." Even the loom cleaners, who are among the lowest paid workers in the plant, now must at least be able to read instructions and punch numbers into a key pad.

But the managers we interviewed in this firm see the need for more education in broader terms than simply providing the skills needed to perform specific tasks. The firm is in the

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[12] Swift also has plants in Erwin, North Carolina, Quebec, and Tunisia.

midst of a major change in their technology and production processes. One result of that change is that, as one manager put it, "the plant has many fewer routine, repetitive jobs." The firm's personnel anticipate that the changes will continue, and they believe that if their employees have a more solid basic education they will be better able to manage those changes. The training director described one worker whose job was still repetitive and who was still able to manage despite his inability to read, but added, "One day we will have to change his job and he is not going to be able to do it." The managers also believe that turnover would be lower in a better educated workforce.

One of the most dramatic changes caused by the upgrading program was an immediate need for dozens of fixers trained to repair and maintain the new equipment. The company found that some of the fixers they already employed could not keep up with the training, and there was a shortage of other workers who were adequately prepared and who might be promoted to the maintenance jobs. Managers admit that although they would like to do so, they are unable to recruit sufficiently skilled workers for these posts from outside the plants. Indeed, they believe that without measures to improve the basic education of the firm's workforce, over the next decade they will not be able to find workers either in the firm or in the local labor market with the skills and ability to fill a broad range of jobs in their plants.

As a result of these developments, Swift established the Renewal Education Program (REP). Conducted at an off-site

education center that is run in conjunction with the local school district and Columbus Technical College, the program is voluntary and open to all workers, including supervisors. Even though the workers attend the program on their own time, during the fall of 1989, about one third of the hourly workforce was enrolled in the program. The REP offers students three different levels of instruction. In the basic literacy classes, participants learn to read elementary texts and are taught to add, subtract, multiply and divide. Of the 336 participants in the company's REP program in October 1989, 39 were in the basic classes. In the second level, students learn to read and comprehend what is generally written for public consumption, such as newspapers and magazines. And they learn to use computational skills to solve everyday problems such as balancing a checkbook. In the highest level, participants learn to read materials meant for personal enrichment such as novels, and more advanced material such as job-related technical manuals. At this level they gain the ability to use computation skills to solve problems not previously encountered. Participants can also work towards a high school equivalency degree (GED). In addition, the company offers to pay 75 percent of tuition costs for any employee working toward an associate or higher degree. One specific course for technicians is also taught at the college, and others are in the planning stages. Swift pays a full-time coordinator and a small budget to cover incidental costs, school district (funded by the county) provides teachers, and the college (state

funds) donates space; both the school district and the college earn credit from the state based on enrollment in the Swift program. Thus for a modest investment, then, Swift has leveraged state and county funds in support of its own worker training.

Swift has achieved a high participation rate through an energetic internal marketing program. The coordinator of the program takes responsibility for showing the firm's employees what they have to gain from continued education. The general aura of modernization in the plant has helped this and in some cases, promotions are at least informally linked to progress in education.

Creating the Renewal Education Program has permitted management to link educational requirements explicitly to internal promotion decisions. Although the company does hire recruits who have not graduated from high school, starting in late 1989, all such workers were required to sign a pledge saying they would work toward a high school diploma. Supervisors will be required in the future to have at least an associates degree (some of the current supervisors do not have even a high school diploma).

Parallel to these innovations in off-site education have been significant changes in in-house training. Before the new equipment was introduced, workers preparing to take new positions were assigned to work with an experienced worker until that worker judged that the trainee was prepared to work independently. Some workers also took short formal training

courses. Now in-house training for most jobs is longer and is more formal. Workers are assigned to a training division payroll while they are in training. Before the modernization, the training department typically was training between 10 and 12 workers at a given time. During the modernization period the department often had 150 workers on its roles, but after the firm had adjusted to change, the training head count dropped to about 30. Training has increased for three reasons. First there has been a small growth of the labor force. Second, the training is now more extensive. This is especially true for the technical workers, who account for about one fifth of the trainees. But training for machine operators has also been expended. Finally, while in the past almost all of the training was for new hires, now the training department spends about one half of its funds and efforts on retraining experienced workers.

Although the in-house training programs and the REP are administered separately, their functions are closely related. As training increased, the training managers found that many of the students did not have adequate basic skills to participate in the training programs. This was particularly true for fixers. The introduction of modern open-ended spinning machines overwhelmed the capacities of the firm's corps of fixers, yet the firm was unable to find students either from inside the firm or from the local labor market prepared to learn the required skills. Thus the REP coordinator designed a pre-fixer training course to teach students to do such things as "accurately use a calculator for

basic mathematical calculations, use basic mathematical formulae in order to calculate pressures, voltage, amperage, electrical resistance, and temperatures; determine acceptable tolerances of machine parts based on machine drawings, accurately read machine drawings and derive specific dimensions from them, and differentiate among discreet components in simple electrical schematic diagrams." This class consisted of 15 three hour classes, and it is indicative of the skills problem faced by the firm that of the 32 students who entered the first class, only six successfully completed the course. Most of the students who failed to complete the course did not have an adequate background in math. It also revealing that traditionally fixers did not need these types of skills. As a training manager said, "In the old days all the mechanic had to do to fix a loom was to get a bigger hammer."

Despite these increased training activities, the training and education programs at Swift are still in transition. Until now, the two programs have been coordinated informally, and, because many employees lack even basic literacy and numeracy skills, there has not been much room for combining education and work-specific training. This gap may narrow in the future. It is also true that Swift has not experimented much to date with reorganizing the work process by creating teams or semi-autonomous divisions. Other firms that have tried this path might find it possible to incorporate more training on the job

since workers have more contact with other employees and perform a wider range of tasks.

One feature that distinguishes firm-based training in the textile industry is the necessary emphasis on improving basic education. Yet the textile industry is also like other industries in that the push for enhancing education and training has been clearly and directly related to the changes needed to respond to new market conditions.

But regardless of the training strategies of textile firms in other countries, without a work force able to handle sophisticated machinery, communicate clearly about production schedules, and adjust to more variable and more complicated work routines, the domestic industry's strategy of quick response and market specialization is much less likely to be successful.[13] In this sector, the important social goals of extending literacy to the entire work force and improving occupational mobility for the least educated workers have converged neatly with the goal of

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[13] Moreover, there is some anecdotal information that suggests that training in the textile industry in some competitor countries is also improving rapidly. Although there do not appear to be rigorous published analyses of programs in these countries, analysts returning from visits to textile plants and schools in Europe report some growing programs. For example, some regions in Northern Italy have technical secondary schools that are closely associated with the local textile industries. These schools train entering workers for the industry. Unions and employer associations have taken the main responsibility for establishing upgrading programs, although these are often done in conjunction with local educational institutions. (For a description of some of the programs for small firms in various European countries see Stuart Rosenfeld, "Regional Development European Style," Issues in Science and Technology (Winter 1989-90), pp. 63-70.)

increasing industry competitiveness.

IV. Retailing

The retailing sector has been profoundly affected by broader changes in the world economy in the last decade and a half. The nature of competition has changed, and new types of retailers and products have appeared to fill increasingly diverse market niches. In the process, firms have altered the way they recruit and use labor, from management levels to the least skilled store positions. These changes are significant because they affect a large segment of the labor force: retailing accounted for 17 percent of all nonagricultural jobs in 1987; it is the largest employer of young workers and a major employer of women.

In this section, we outline the broad trends affecting retailers' strategies since the late 1970s and analyze their implications for firm-based training. Our findings are drawn from field research and apply to a broad segment of retailing, including department stores, specialty stores, supermarkets, drug stores, convenience stores, and some discount outlets. An overview of trends in marketing and subsector restructuring is followed by a discussion of employment and training strategies.[1]

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[1] Information for this section is drawn from trade literature, government publications, interviews with investment analysts specializing in various aspects of retailing, and interviews with training executives and store managers. See Thomas M. Stanback, Jr. "The Changing Face of Retailing," in Skills, Wages and Productivity in the Service Sector, Thierry Noyelle, editor, Boulder, Colorado: Westview Press, 1990. For

Like other sectors analyzed in this report, we find that retailing has relied extensively on organizational transformation, changing recruitment strategies, and a new emphasis on training to adjust to the new marketplace. A detailed look at recruitment and training in one firm at the end of this section will help bring these points into sharper focus.

The changing competitive environment and new modes of retailing

Retailing has been dramatically affected by the changing consumption patterns we described in the first part of this report. Market segmentation and differentiation, together with other trends such as the aging of the baby boomers and an increase in two-earner families, have not only made traditional markets more varied, but have opened vast new markets that also tend to be highly volatile. Thus the burgeoning demand for work and leisure apparel, quickly prepared food, and home furnishings, to name just a few examples, encompasses highly fragmented demand for products catering to different tastes and budgets.

As the number and variety of products have increased, so has competition for shelf space in stores. Producers can no longer be aloof from the retailing stage but must develop closer contact with store managers and buyers, in order to both insure a place

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comparative analysis between U.S. and foreign retailers, see Olivier Bertrand and Thierry Noyelle, "New Forms of Employment in Services: France, Japan, Sweden and the United States," forthcoming.

for their goods and monitor the market. For retailers, in turn, merchandising has become much more important as organizations have vied to distinguish themselves from competitors through sharper and more focused selections of goods. And at all levels in retailing, a greater emphasis must be placed on interacting with customers, both as a way of developing customer loyalty and as a means for becoming more sensitive to changes in demand.

The strategies for establishing a competitive advantage in this new environment have varied widely. While some firms have responded by moving entirely to broad discount merchandising, even doing away with traditional store display and packaging formats, others have sought to specialize in particular types of products, if necessary allowing prices to rise, with a view to singling themselves out in the marketplace. Both strategies have been facilitated by the application of new technologies, and both have entailed changes in the way the work force is recruited and managed.

The spread of computer applications has been an integral part of all large firms' competitive strategies. Computer systems make it possible to monitor inventory and sales more efficiently and to tie the information generated to decisions at headquarters and distribution centers. Stockroom inventory levels may be sharply reduced or eliminated, and vendors may even be directly informed when store supplies need replenishing. Many successful U.S. retailing organizations now operate just-in-time store delivery systems, eliminating most of the need for in-store

stockroom. Only among some of the most successful Japanese retailers have we found a similar widespread use of this cost-savings technique. Bar-coding, scanning and point-of-sale (POS) technology have drastically reduced the cost of pricing, accounting and inventory control at the same time that they have cut down on the labor needed for check-out.

Rather than determining which competitive strategies are best, the new technology has made a broader range of strategies plausible. If there are tensions, they occur where economies of scale are threatened by the need to stock smaller quantities of an increasing number of products. Previously, economies of scale in retailing were related largely to the ability of very large national retailers to extract more favorable terms of purchase from vendors. As competition for shelf space intensifies, the bargaining of large buyers has been strengthened even further. The interesting twist, however, is that as more regional firms have gained in size and acquired bargaining power, the relative advantage of the very large national chains has diminished. The latter can still compete effectively by standardizing operations in many similar or identical outlets, but, in doing so, they may lose some of the flexibility of regional chains in responding to local patterns of demand. It is not surprising to find that regional companies have emerged as some of the most dynamic retailers in major subsectors such as supermarkets and department stores.

Market segmentation, market restructuring and organizational transformation

Changes in the nature of competition have caused spontaneous restructuring of major subsectors within retailing, a process that is still underway. Many of the older, well-established national chains that thrived in earlier decades by expanding look-alike stores into new communities have had to scramble to compete with once poorer regional chains. The latter, in turn, do battle with a panoply of new types of stores, ranging from discount warehouses to specialty chains that reap benefits from economies of scale, but manage to create highly targeted and differentiated company images.

Consider, for example, recent trends in apparel retailing. Before the 1960s the traditional department store dominated the general merchandise segment of U.S. retailing. Their first major challenge was the rapid spread of discount department store chains in the 1960s, which surpassed traditional department stores in total sales by about the middle of the decade. Both national (e.g., K Mart) and regional (e.g., Wal-Mart) discount chains have expanded rapidly, but discounters' actual market share increased little after the beginning of the 1970s. Many failed to offer acceptable quality goods to gain a loyal following and lure customers away from department stores, which increasingly could compete by cutting costs through aggressive introduction of POS and other computerized technologies.

Some department stores also responded to the competition by converting to a discount chain mode, as Sears did, belatedly, in 1989; others, by switching to a narrower emphasis on certain product lines such as apparel and furnishings, as J.C. Penney did in the early 1980s. Still, by the mid-1980s, the department stores were being squeezed from yet another direction: the specialty chains. By creating numerous, nearly identical outlets, the specialty chains rapidly became able to buy on favorable terms and offer wide selections of goods. These chains also have cultivated a reputation for better customer service. Apparel specialty chains such as The Gap, Inc., Esprit, The Limited, Inc., and Ann Taylor have grown rapidly, mainly at the expense of department stores, as have other specialty chains that have brought increased competition in areas such as toys (e.g. Toys "R" Us), electronics (e.g. Circuit City), auto supplies (e.g. Pep Boys), home maintenance and repair (e.g. Home Depot), and optical services (e.g. Royal International).

All of these stores follow a similar marketing strategy: centralized merchandising, buying, pricing and advertising; narrow product lines, yet fuller and more varied ones, within given product classifications, than those available in department stores; and some, but limited, decentralized decision-making about pricing, display, and merchandising in order to maximize responsiveness to local market variations.

A similar process has taken place in food retailing. National supermarket chains dominated food retailing in the 1950s

and 1960s. Their growth model was based on proliferating look-alike stores with similar merchandising. Beginning in the 1970s, a burgeoning number of food specialty stores forced supermarkets to experiment, first with larger stores, where buyers could gain even more leverage over suppliers and support deeper discounts, and later with specialty departments and higher value added products.

While supermarket operating margins grew -- from below 3 percent in the late 1970s to well above 4 percent in 1987 -- the successful national supermarket chain became something of a dinosaur. A&P, once the largest and most successful national chain, collapsed during the 1970s and reemerged as a regional operation. Other regional chains have shown strong growth. They compete either by employing new strategies to bring down prices -- the European hypermarkets (Carrefour) and the American warehouse clubs (Price's Club, Sam's) exemplify this trend -- or by moving into upscale markets and broader product lines. Another, still different entry into food retailing has come from the convenience store chains, which have shown spectacular growth in the last ten years. Starting with gasoline and a modest mix of convenience foods, the chains now offer a widening variety of impulse food items, deli foods, and services such as video rentals.

These examples illustrate the broad trends in retailing as companies respond to the increasingly segmented and differentiated market: the demise of the all-purpose, national

store; the rise of regional chains; and the increasing polarization of companies pursuing either discount or specialty retailing strategies. Our field work also shows how reorganization inside firms can complement these strategies. Companies are centralizing those aspects of the operation where either economies of scale (buying, inventory control, pricing, and record keeping) or economies of scope (merchandising, advertising) are important. They decentralize those functions that allow for greater local market responsiveness, store productivity and quality control: store reordering, promotional sales and, above all, human resources management.

Changing skill needs

The change that has affected workers most is undoubtedly the much greater emphasis on customer service. Increased competition has meant that efforts to improve merchandising and pricing strategies do not suffice to set retailers apart. The goal must be to provide customers with a "shopping experience" that they will want to repeat. Where stores have more than one branch, the reputation of one tends to affect all the others. Thus all the executives interviewed stressed the importance of improving customer service across the board. In a retail environment which, for many years, emphasized self-service, some highly successful regional chains have built their market image around intensive servicing of customers by store personnel. Seattle-

headquartered department store Nordstrom is the most prominent example. Each sales employee is trained to develop his/her own list of clients and to call on them when new articles are brought into the store. Clients are pampered. Sales personnel is highly paid, in part through large bonuses. The results speak for themselves. Average sales per employee at Nordstrom's are twice higher than the industry's average, and the company is consistently one of the most profitable retail organizations.

Admittedly, Nordstrom's case is an extreme one. However, for all retailers, improving service cannot be achieved without improving the quality and training of the staff. For over 30 years now the trend among retailers has been to rely increasingly on part-time labor -- especially young workers and women -- to fill in-store, service related jobs. In the past, such workers were widely considered as temporary; they were not expected to spend a lifetime with the company or move up to supervisory positions. Logic dictated that management invest relatively little in training, or, more precisely, that training be restricted to information about company policy and about particular jobs. In addition, some technological changes helped make some jobs easier and actually reduced the need for specific training.

In the context of the retail environment of the 1980s, however, firms have begun learning that, when customer service and sales becomes crucial to company image and maintaining market share, workers must have a set of wider skills: the ability to

communicate with customers, knowledge about other products and services in the store, and, at times, even a wider knowledge about how products and services are used and whether they are offered by competitors. In turn, successful firms have discovered that such skills were needed by all, regardless of the temporary or long-term nature of their attachment to the company's labor force, since each customer-employee interaction reflects upon its image in the marketplace.

Managers, at the same time, have found their jobs transformed under the new market conditions. To be sure, certain aspects of store managers' jobs have become simpler. Buying and record keeping in branch operations have largely been centralized and transferred to computers. Central offices tend to give more assistance to store managers now and frequently dispatch specialists to give advice about display, training, and even hiring. Increasingly, though, branch store managers are called upon not only to keep daily operations running smoothly but to act as trouble shooters and problem solvers, to feed back merchandising, pricing, or display decisions of local competitors to the central offices and to serve as human resources managers. As products proliferate and stores stay open for longer hours, the job of simply monitoring store operations becomes more complex. The emphasis on customer service also makes training and supervision of personnel more demanding. And higher level

managers, meanwhile, are burdened with many of the tasks formerly carried out in stores.[2]

In summary, although the application of computer technologies has simplified many tasks, new competitive conditions place pressure on firms to upgrade the skill levels of their employees. The emphasis on customer service, in particular, requires all employees to have better communications skills and a broader knowledge of store and back-office operations. In turn, the efforts by firms to tailor retail strategies to particular market segments place new and more complex demands on managers at all levels.

Strategies for adjusting the work force

Retailers have a number of options in responding to these new demands on workers. Strategies to upgrade the work force include recruiting workers who are more highly skilled; reducing turnover, either by hiring workers they think will stay or by offering better employees incentives for staying; expanding training; increasing supervision; and encouraging voluntary educational upgrading by employees. In practice, most retailers have adopted a combination of these approaches.

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[2]. For a discussion of the historical transformation in the distribution of functions in large retail organizations between stores and central offices, see T. Noyelle, Beyond Industrial Dualism, Chapter 4, (Boulder, Col.: Westview, 1986.)

Most, if not all, companies are giving increased attention to recruitment of store personnel. Human resources departments assist store managers in recruitment and hiring more than they did in the past, and they try to impose higher standards for entry-level jobs. However, labor shortages exist in some markets, and although firms can compensate by extending recruiting to other groups (for example, retirees), they are clearly limited in the educational credentials they can require for entry-level positions.

Recruitment of management personnel has also undergone some changes. Although some companies still hire management trainees without college degrees, there is a clear tendency to regard college education as an important qualification, and some firms require it for certain management trainee programs. This trend has not prevented a new interest in hiring from within the ranks of current employees, but with companies favoring those workers that have already acquired some college education.

Indeed, encouraging internal promotions is one way that retailers can work to upgrade the labor force. By emphasizing the advantages of seeking a career in retailing, firms can build company loyalty and create incentives for upwardly mobile part-time employees to stay. Such workers offer the further advantage of already having been schooled in company policy. They may also be able to apply their first-hand knowledge of lower-level jobs to problem-solving as supervisors. Work experience, at the same time, does not completely compensate for the lack of a college

degree. Managers from several regional chains (Publix, Eckerd's, and Lord and Taylor) report that they would still be likely to hire a college graduate over a non-graduate with work experience. Some companies (Schnucks, for example) encourage management-bound employees to attend college and offer tuition assistance, a policy that has the dual effect of retaining lower-level workers and increasing the recruitment pool for managers. The reasons are simple and range from stronger socialization to an ability to learn faster and a demonstrated ability to pursue and accomplish personal goals.

Other benefits are also added by large retailers to encourage workers to stay. Most large companies provide a well rounded package of benefits, often including retirement. However, there are certain contradictions inherent in aggressively encouraging full-time, career employment. First of all, full-time workers are not necessarily more skilled than part-time workers; on the contrary, young students and women with families may be highly qualified but prefer part-time schedules. Second, the scheduling flexibility that retailers can achieve through the use of part-time labor is more difficult to attain with full-time employees, who are often far less willing to work during evening, week-end, and holiday hours. Third, part-time labor costs less precisely because most part-time workers are not eligible under company rules for benefits packages. Clearly, retailers want to strike a delicate balance between encouraging

long-term employment and continuing to rely heavily on part-time, temporary labor. The key to striking this balance is training.

A new emphasis on training

Most of the firms we visited have sharply revised their training program in recent years. Training has generally become more formal, with more use video presentations and classroom teaching, and there is more investment in planning the content of training programs and classes.

One of the key changes is the insistence that everyone be trained. Part-time and full-time exempt workers receive the same training for similar jobs, and training courses have been developed for the lowest-skilled occupations, such as supermarket baggers, as well as for those with greater responsibility and complexity. This has meant a surprisingly high investment in training of part-time workers. Even though turnover is traditionally high among this group, firms reason that a competitive strategy based on improving customer service and responding quickly to market shifts cannot be successful without involving all workers.

The content of training has also become more systematic in its coverage of three areas. The first is company "culture." Employees are taught company policy in such matters as dress code, work rules, pay, benefits, and are inducted to the company's philosophy and ideas about its market image. Second,

product knowledge and specific job skills are taught. Product training varies substantially by type of job; in supermarkets, for example, cashiers may be given rudimentary instruction in the location of products, while attendants in the produce or meat sections need more specific knowledge about how to store and prepare various foods. In some cases -- an example is cosmetics sales in department stores -- vendors supplement store training and teach sales workers how to distinguish among numerous products and describe their virtues to customers.

Finally, much more attention is being given in training programs to customer relations skills and "people handling." Each company has a slightly different way of presenting this material, but it has become an integral part of almost all training programs in large stores. While floor workers may be taught guidelines for etiquette in dealing with customers or how to react in difficult situations, managers also receive instruction in techniques of supervision and customer relations.

Whatever their precise content, the programs differ strikingly from the informal style that characterized the training done by many retailers in the past. Yet, at the same time, the training remains quite specific to firm and job needs. There is very little broad educational content involved, except perhaps in the context of specific job skills instruction (such as counting out change to customers or writing orders). So long as retailers are able to find part-time and temporary workers with at least minimum basic skills, they reason, the main

objective of training is to turn workers into company players by the most efficient means possible.

This strategy has placed additional pressure on upper level jobs, particularly store and department managers, who must not only be prepared to do increasingly complex jobs but also to respond quickly to problems that floor staff are not equipped to handle. As we noted in the last section, the trend is toward recruiting only college-educated managers and, if possible, promoting them from inside the firms. In addition, management training has become much more elaborate (see case study below.)

Retailing continues to be a sector in considerable flux. Widespread buy-outs of large companies, continuing market segmentation, and the slackening of consumer demand are among some of the factors that keep intense pressures on retailers, guaranteeing that only the best and the fittest will survive in tomorrow's retail environment. Training is likely to change along with other types of adjustments in response to this continuing high-pressure environment. The more successful regional chains seem committed to more internal promotions as one way of building company image and esprit de corps. This should mean preserving the split between fairly narrow training for lower-level workers and increasing sophistication in management training.

Significant labor shortages for entry-level jobs, or an inability to recruit sufficiently qualified temporary labor, might change this balance, however, in either one of two ways. It might increase company incentives to broaden the extent of

training for workers at the lowest levels. It might also accelerate the substitution of technology for labor, particularly those technologies that enhance the quality of the service as perceived by the customer. In this respect, it is important to note that it is only over the past few years that check-out counter scanning technology has caught on massively. Along those lines, some supermarkets are now experimenting with customer-operated check-out counter, resulting in large savings in the number of needed cashiers; others are working on better display techniques to reduce the need for customer assistance.

Trends in training: a case study

Giant Food Inc. is a large, mid-Atlantic, regional chain of supermarkets, with 148 stores located primarily in the Washington D.C. and Baltimore metropolitan areas.[3] In a retail sector that has become increasingly competitive and segmented, the company's strategy during the 1980s has been to emphasize a long tradition of quality foods and customer service and to position itself as the dominant, local, upscale supermarket.

As part of its strategy and in response to shifting consumer demand, the company has diversified its offering by both expanding its traditional inventory and opening new departments next to the traditional grocery, meat, produce and bakery

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[3]. "Why Giant Food is a Gargantuan Success", Business Week, December 4, 1989.

departments: delicatessen, salad bar with an extensive menu of prepared foods, bulk food, sea food, flowers, and pharmacy. The average size of stores has increased as a result (through new construction and the remodelling and expansion of older stores) from roughly 35,000 square feet on average for the older stores to 50,000 - 55,000 square feet on average for newer and remodelled stores.

The company employs approximately 25,000 staff, including 18,000 store employees, 2,000 staff in the corporate offices and 5,000 in other operations. The last category includes not only warehousing and distribution (approximately 3,000), but also maintenance, refrigeration, store cleaning, store remodelling and construction (approximately 2,000). Contrary to a trend found in many other large firms, the company has pursued a policy of handling all operations in-house.

As in the case of other successful retailers, the company has struck a new balance during the 1980s between centralization and decentralization of key retailing functions. On the one hand, merchandising, buying, pricing, marketing and advertising are heavily centralized at headquarters in part to help promote a unique company image throughout its market area, with a high degree of consistency from store to store. On the other hand, reordering, inventory control, and human resources management are heavily decentralized at the store level, and store management is responsible for maximizing profits by both ensuring that the right volume of goods is flowing through the store at any one

time and making sure that store employees are properly motivated, quality of service is as high as possible, and customers are satisfied.

Of the 18,000 store employees, roughly 3,000 are employed as cashiers, 2,000 as laborers (handling goods and restocking shelves in the self-service departments), and 1,500 or 2,000 as baggers. The remaining 11,000 or so are employed as staff in the store's departments or in store management positions. Nearly 40 percent of the company's labor force are women and 35 percent are black or hispanic.

For many years, the emphasis was on developing part-time employment. Today nearly 60 percent of the store employees are part-timers, a level that was reached sometime in the mid-1980s. Changes in labor market conditions are forcing the company to reassess its dependency on part-time employment, however. To begin with, while the turnover rate remains low among both full-time career workers and a relatively large group of permanent part-time employees, at approximately 15 percent annual, the turnover rate among non-permanent part-time employees (approximately 5000 job positions) is very high, at about 200 percent. (For purpose of comparison, large fast food chains which are structured around the very use of high turnover part-time labor, will often experience turnover rates of anywhere between 250 and 350 percent annual). Second, even if the company was willing to continue to bear the costs associated with such high turnover, the traditional sources of part-time workers seem

to be drying up. The demand for part-time employment by women has peaked; youth are not as flexible as they once were; and there are impending shortages of young workers as the result of the lower birth rates of the 1970s. The company is trying to compensate for these shortages by reaching out to retirees as a new potential pool of workers. The firm has also learned that by accommodating scheduling demands of part-time employees, it can lower absenteeism and turnover rates. In general, however, the company is making changes to reduce somewhat its reliance on part-time employment and to attract more full-time staff by emphasizing career opportunities within the firm.

Another way in which the company is adjusting to changing needs is by trying to raise the educational attainment of its labor force. Of today's 148 store managers, 75 percent have some college education and 40 percent have a four-year college diploma. This is a shift from the recent past which has come about in two principal ways. Upwardly mobile store employees are informed that college training is becoming increasingly helpful in reaching management jobs -- although college education is not a formal requirement. In addition, the company is reaching out to a larger pool of outside junior managers to staff its managerial ladder. Today, 40 percent or more of the retail management trainees are now recruited outside the company, instead of 20 percent or less just a few years back.

Such efforts to adjust the make-up of the labor force are complemented by an extensive training effort. A large entry-

level training program is provided to all new clerks, including both full-time or part-time employees. Entry-level training represents approximately 200,000 work-hours annually and contributes to the employment of 18 full-time trainers.

Every store clerk is put through a general five hour company orientation program which emphasizes the company's philosophy and policies (regarding pay, benefits, etc.) In addition, each new hire is offered a skill-specific training program related to the job for which he/she is being hired: grocery stock clerk, cashier, bagger, bulk food clerk and so on. New cashiers, for example, receive two full days of classroom training plus one day of in-store training in the use of the scanning device. On average, new hires receive several days worth of training emphasizing technologies and/or products relevant to the area in which they are working. Initial training is supported by on-the-job training, with department managers playing a major role.

Parallel to its entry-level training program, the company has a highly structured management development program designed to assist a selected number of lower-level workers and outside management recruits in moving up the ladder. The first step of the promotional ladder consists of a long (one and one half to two years) period as "retail management trainee." Graduates go on to become department managers; about 70 or 80 new department managers are trained each year. After several years, some department managers will go on to become assistant store

managers, and may ultimately become co-managers, store managers, and even district managers.

At each promotional stage, individuals go through a training-only period that combines formal instruction with hands-on experience. Department manager positions, for example, begin with three to four months of training during which employees are rotated from store to store, learning how to adjust the product mix of different departments to different neighborhoods. Assistant store managers begin with a six-month training period when they are taken off the payroll of individual stores and paid directly by headquarters. At each promotional level, different skills are emphasized both in the work experience and the training of managers: store payroll, accounting and inventory, store emergency management procedures, and rudimentary supervision skills for management trainees; managing for profit, by optimizing flows through proper inventory control and by minimizing waste, for department managers; trouble shooting and problem solving for assistant managers; human resources management for store managers.

This high level of investment in management training is evidence of the importance of managers' skills to the company's competitive strategy. Department managers are responsible for all product reordering, product care (proper refrigeration, for example), and presentation. They also play a major role in on-the-job training of their clerks and manage, on average, 20 other employees. The trend toward larger stores also means that store

managers and their assistants are supervising larger staffs, ranging from 80 to 550 employees.

This case study serves to illustrate what has been found in other parts of our research on retail. In a sector typically perceived as "low skilled," there is evidence that successful firms must complement the limited, but nevertheless sizeable training of their main labor force with a very substantial investment in extensive managerial training. Such training forms the basis for the application of a given firm's specific service technology, which, in turn, serves to set the company apart from its competitors in the marketplace.

V. Business Services

It is by now commonplace to assert that the explosive growth of the services in the postwar decades marked a significant transformation of the modern economy. Less frequently do observers note that the service sector is itself subject to many of the same pressures affecting industry. Industrial restructuring and the reorganization of production that has accompanied this process are also evident in the services. The implications of these changes for skill formation in the labor force are, moreover, especially important given the size and continued growth of the share of service employment.

In Section II of this report, we examined the transformation of skills and changes in training in one service area, banking. Here we analyze changes inside a sector of the services that has been the subject of considerably less attention, even though its growth record since the 1970s is among the most impressive in any part of the economy.[1] The sector described as "business services" encompasses a variety of loosely related activities that serve business customers. Unlike the other cases included

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[1] This section of the report is based on research conducted for the National Center on Education and Employment, Teachers College, Columbia University, under funding from the Office of Educational Research and Improvement, U.S. Department of Education. The findings are discussed in more detail in Thierry Noyelle, "Skill Needs and Skill Formation in Accounting, Management Consulting and Software," Conservation of Human Resources, Columbia University, July 1989.

in this report, the business service subsectors we examine here -- accounting, management consulting, and software -- employ a high proportion of college-educated workers. This fact makes the recruiting strategies and training problem for firms unique in certain respects. Yet, as we will also show, firms in these sectors must confront similar competitive and technological changes to those found in other industries and, as a result, they adopt overall strategies toward skill formation that are often remarkably similar to those of very different sectors.

This section outlines the changing basis for competitiveness in the sector and discusses the implications for workers skills. We then look at changes in recruitment and training designed to respond to this situation. Finally, a case study of training in one firm will illustrate trends that are widespread throughout the sector.

Market transformation and patterns of growth in business services

Business services has been one of the most dynamic sectors of the U.S. economy in the last two decades. Between 1970 and 1980, employment in business services increased by 84 percent, compared to a rise of 31 percent in employment for the private sector as a whole; between 1980 and 1986, the difference in growth rates was even more striking, with employment increasing by 54 percent in business services compared to 11 percent in the

entire private sector.[2] Certain subsectors, such as computer software and data processing or management consulting and public relations, showed even more dramatic growth (see Table 5.1).

Even more impressive is the record of international competitiveness of U.S. firms in business services. Worldwide revenues of U.S. firms in 1987 in the three business services sectors covered in this report amounted to between 40 and 50 percent of all revenues in accounting and auditing, and approximately 50 percent of all revenues in both management consulting, and software and data processing (Table 5.2). U.S. firms in all three sectors dominate the lists of top firms when these are ranked by size. In management consulting, for example, eighteen of the largest twenty firms worldwide are U.S.-headquartered (see Table 5.3).

Uneven growth among the subsectors of business services reflects the variety of activities encompassed by this category. While some subsectors such as advertising and accounting are relatively mature, others (e.g. computer software) are in fairly early stages of expansion. Nevertheless, certain patterns of development appear to be common across subsectors. For example, a pattern of rapid growth followed by market saturation and restructuring can be found in several industries. Such trends

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[2] In 1970 business and related services accounted for 4 percent of total private sector employment; this figure increased to 8 percent by 1986. Yet, there is some evidence that employment in the services has been underestimated since government data, particularly for the period before 1980s, are unreliable.

relate not just to industry stages of development, but also to broader transformations of the economy in the 1970s and 1980s. In addition, as in other service industries, the diffusion of computerized technologies has helped transformed both the work process and the output of a number of those industries.

Let us look, for example, at recent patterns of growth in the three subsectors covered in this report: accounting, management consulting, and software.

The accounting and audit industry in the United States has undergone several major changes in its structure since the turn of the century, but none so profound as the transformation that has taken place since the beginning of the 1980s. The latest set of changes is largely the result of the industry's response to accelerated competition, increasing market segmentation and market differentiation, and the diffusion of computer technology -- the processes described at the beginning of this report.

The sharp upswing in mergers and acquisitions and privatization of publicly-owned firms in the 1980s have resulted in the elimination of a good number of very large (and traditionally very profitable) public audit accounts. Together with the computerization of the audit process which has helped lowering costs, these changes have contributed to increasing competition and lowering audit fees. In addition, clients have become more demanding. They have been asking for audit expertise which is both much more industry-specific and also more analytic than traditional auditing and accounting services; they have also

asked for more non-traditional services. In turn, firms have responded to these pressures by pushing further into new types of expertise. They have been helped in part by computer technology which has cut down enormously in the traditionally large number-crunching work associated with accounting and audit.

In tax planning, for example, major changes in the tax law under the Reagan administration have called for substantial change in the substance of traditional services to firms. At the same time, increasing internationalization of production and markets has meant that clients need a more complex set of services. Together with computerization that has alleviated much of the grunt work associated with preparing tax returns, these changes have accelerated a shift towards more complex tax consulting services, including giving more advice to firms about how to relate their tax planning to other management decisions.

Meanwhile, management consulting, also a long-established sector, has too undergone significant change. Growth in management consulting services slowed considerably in the 1970s, as clients began to hire their own MBA "experts" and to use them to diagnose business problems. Management consulting firms in the 1980s responded by differentiating more from earlier, standard practices, mainly by offering not only to diagnose existing problems but also to find and apply solutions. This shift was accompanied by increasing specialization. A panoply of specialty consulting shops emerged in the 1980s, including, for example, actuarial consultancies to help firms with compensation

and pension plans, consultancies with an expertise in training, and firms specializing in information systems.

Data processing and software, too, have undergone a similar process of diversification and restructuring. In this newer sector, the period of commercialization of the first generation of mainframe computers (roughly, the 1960s) was a time of very rapid growth for a data processing industry organized around firms that offered essentially similar services to most clients. So-called service bureaus offered processing time and some custom software development services to corporate customers on the bureaus' mainframes. The beginning of the end of this phase of data processing industry was marked by the introduction, in rapid succession, of the mini- and micro-computers in the mid- to late-1970s. Because computing could now be done increasingly by the users, demand burgeoned for packaged software (and for increasingly diverse software products), for systems integrators that develop custom applications for users using available hardware and software, and for software "consultants" that work as specialty subcontractors on software development. The new structure of this subsector comes closest to resembling the idealized pattern of flexible specialization described in the introduction: a growing number of small specialty firms and individual consultants connect to each other, to larger software firms, and to clients in a web of relationships that allows both flexible response to the market and continued innovation.

It should already be obvious from this discussion that one of the results of restructuring inside the various business services sectors has been a blurring of the boundaries among both their firms and products. Accounting firms performing management consulting, management consultants acting as computer specialists, software experts developing ways to organize accounting information -- these examples mark only a few areas in which business services are increasingly interconnected. This trend has further intensified competition and has thus pushed some firms to specialize further or to explore new service areas. As they do so, they create demand for new skills, and increase demand for specialized workers.

We should note, here, that industry profiles continue to be very different, with large firms playing a much more important role in accounting -- where the "Big 6" control about one-third of the industry's revenues -- than in either management consulting or software.[3] This difference -- the proliferation of small firms in some sectors and much higher levels of concentration elsewhere -- makes training programs and their reform different, too, since smaller firms tend to rely more on

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[3]. Previously known as the "Big 8", the group of large firms that dominate the U.S. accounting industry has now dwindled to six, following the mergers of Ernst & Whinney with Arthur Young (October 1989) and Deloitte, Haskins and Sells with Touche Ross (December 1989). In 1988, the then "Big 8" firms controlled over a third of the accounting/auditing revenues in the United States. In contrast, the top 30 software and data processing firms controlled perhaps 15 to 20 percent of their industry's revenues; the top 20 management consulting firms, 10 percent or less.

informal training while larger firms will concentrate on revamping existing formal training programs. We will return to these points below.

Changing skill requirements

The transformations inside business services sectors affect the skill requirements for workers in several ways. First, as we have noted above, intensified competition and the push to expand in new areas of business services implies an expanding need for new technical skills. Second, many firms have reorganized internally in such a way that more employees have direct contact with clients and must, in the course of their jobs, act as sales representatives to push other services available in the firms. This has been helped by the introduction of PC-based technology, which has cut down in the number of junior professionals needed to carry out routine work and has shifted the balance towards more senior personnel who can be placed more directly on the front line. Third, firms' competitive strategies create a growing need for employees with more specialized skills. In virtually all the interviews we conducted with executives in the business services, managers stressed the growing need for attention to four types of skills:

1. Technical skills. The services being offered by the three sectors under review have become more specialized at the same time that the technology in use to deliver those services

has become more sophisticated. In addition, many firms are pursuing a strategy of seeking to create firm-specific "service technologies" that establish and protect a niche for them in the marketplace. The result is that the level of technical skills required by personnel is rising. Given the firms' already heavy dependence on college-educated labor, this development places a premium on technical training beyond college, including technical training in firm-specific technologies in the workplace.

2. Customer service skills. Firms may also enhance their competitive positions by emphasizing quality, particularly a sensitivity to clients' special needs. In subsectors such as software, in which many new, small firms not only serve larger software companies but also seek to provide specialized services directly to their own clients, employees who in larger organizations might be sheltered from client contact are often called on to write proposals, make presentations, and deal with clients over the phone. Managers report that such skills tend to be vastly underdeveloped by traditional educational institutions, and particularly in the technical areas that workers are increasingly expected to pursue. Firms also find opportunity in this situation, however, since they have an interest in developing communications media and styles that are proprietary, or that at least have a company "stamp," as a way of further distinguishing market image. This interest gives firms added incentive to engage in in-house communications training.

3. Industry specializations. There is a clear need for greater specialization of two kinds for workers in business services. First, as some firms compete by offering specialized services -- for example, software development for voice synthesizing computers, or management consulting for just-in-time manufacturing -- demand increases for employees with specialized training in particular subject areas. Second, as provision of services becomes less distinguishable from participation in client decision-making, employees must have more specific knowledge of clients' businesses. This faculty can be developed through recruiting individuals with employment experience in client industries or it may also be promoted through firm-based training and seminars.

4. Salesmanship. One consequence of the market volatil ty described above is a shift from a mode of business in which many contracts tended to be "repeat business" to one in which first-time assignments become more and more important. This change puts greater pressure on all employees to "drum up new business" and pioneer new types of services. Some firms have tried to promote "cross-selling," i.e. selling new services to old clients, but have found that this often necessitates bringing together professionals from different divisions who are not accustomed to working together. Better salesmanship thus entails better and new types of communications among employees. Salesmanship may be enhanced, then, simply through promoting communications skills; it may also require extensive in-house

training, though, particularly where firms try to incorporate a sales orientation within the very design of its services.

Upgrading skills through recruiting and promotion

Various approaches are possible for firms trying to improve employee skills in the above four areas. One clear possibility is for firms to try to recruit workers who are already better skilled in these areas. Such workers can be brought into entry-level posts or they may be hired into multiple ports of entry higher up the management chain, in either case receiving in-house training in firm-specific practices and procedures. For a number of reasons, business services firms trying to implement such a strategy face somewhat better labor market conditions than other sector reviewed in this report.

The business services are unusual in their heavy reliance on college-educated labor. This characteristic is shared by the three subsectors reported on here. Each has responded to new competitive conditions in part by increasing educational requirements further and recruiting higher proportions of workers with graduate training. However, because each subsector has a different internal labor market, this new recruiting has played a slightly different role in altering internal promotion ladders in each case.

Accounting firms have tended to rely heavily on internal labor markets and extensive firm-based training. In the original

British system, secondary school graduates were hired to work as "articled clerks" and were promoted, after on-the-job training and examination, to permanent staff and, gradually, up through the promotional ladder. In the U.S. system, educational entry requirements have risen steadily, making formal college-level schooling an increasingly important component of training. More important is the recent change whereby large accounting firms have turned more and more to the external labor market in hiring experienced accountants rather than promoting them from within. This change reflects the trends toward an increasing ratio of senior to junior personnel (in part the result of technological changes that reduce the need for less skilled labor) and toward growing specialization. Recruiting skilled and experienced senior personnel from the outside has been possible mainly for the industry's large firms, which compete with each other for senior personnel but can generally attract talented people from smaller firms with higher pay, generous benefits, and the added prestige of working in one of the "Big 8" firms.

In management consulting, the traditional labor market is strikingly different. Firms have long routinely sought senior-level personnel from outside. If this was true when services were more standardized, the practice is even more pronounced as they become more diversified. The relative absence of a tight internal labor market has encouraged inflation of entry-level requirements; increasingly, a masters degree from a professional school is considered as a minimum requirement for all but support

staff (who themselves are decreasing as a proportion of the labor force).

In computer software, a hybrid labor market is in place and is changing rapidly. While many of the large firms such as IBM, AR&T, and utility companies hire relatively inexperienced technical personnel and train them extensively, most smaller firms have an open labor market and hire externally at multiple levels, often taking advantage, in fact, of training done by larger firms. The trend seems to be clearly toward greater openness as smaller firms proliferate. In contrast to the other two subsectors, computer software also draws a labor pool with a much wider variety of educational backgrounds. In part because most computer science education programs are recent creations from the 1970s and 1980s, the field is still populated with self-taught professionals, many of whom have extensive training in other fields.

In summary, the competitive and market trends described in the first section have had two main effects on hiring practices in business services firms. First, they have contributed to raising already high education requirements for entry-level professionals. Second, they have increased incentives for further "openness" in labor markets. Strong internal labor markets such as that of accounting have opened further, and more open structures such as that of the software industry have remained so. This has been the case in part because of the pressure on all firms to find more senior personnel, and because

greater labor market openness and greater job-hopping is one way in which experience, knowledge and expertise are being acquired. Also, high turnover is one of the way in which firms, in these industries, develop networks of contacts with individuals who, later, may turn back to their former employer for assignments.

The success of these strategies, of course, has depended on the existence of a sufficient supply of educated and trained personnel. The buoyant growth and healthy profits of business services have helped secure a strong supply of experienced personnel, by reducing the risks inherent in job-hopping. They have also made it possible for firms to hire experienced workers away from competitors or from other industries. The growing popularity of MBA programs, business programs, and computer sciences training at four-year colleges has also helped. In software, industry restructuring has itself swelled the ranks of experienced professionals who view working for small, entrepreneurial firms as an opportunity.

However, many industry leaders recognize that this happy convergence of trends may serve their needs in the short run but hardly guarantees a sufficient supply of skilled professionals in the long run. Already certain specializations within the subsectors are experiencing troubling shortages and retention problems. Some firms have responded by tightening ties to educational institutions as a way of securing channels for recruitment. For example, one large accounting firm initiated an undergraduate recruitment program targeted at colleges with

computer science programs. Many firms have also begun recognizing the importance of boosting the productivity of their work process as a substitute to simply adding labor to meet surging demand. Some, especially in the software industry, have begun linking-up with foreign based subcontractors to address domestic bottlenecks. Some firms have begun questioning the justification for the costs arising from high attrition, and are now viewing in-house training as a possible means for creating stronger firm loyalties and lowering turnover rates. Thus far, however, this has not been the major motive behind firms' further strengthening and expansion of in-house training; responding to changing demand and to the never-ending need for strengthening firm-specific service technologies has been.

Strategies in training

Because business services firms have been better able to hire trained personnel from the outside, firm-based training has tended to emphasize overwhelmingly instruction in firm-specific service technologies, products, and procedures. Again, the degree to which such training is formal and linked to promotion varies substantially by subsector. Training has tended to be more highly structured in large accounting firms, for example, and much more informal in smaller consultancies. In the latter, project teams and assistantships often work as mechanisms for

passing information and skills from more experienced to less experienced professionals.

Firm-based training focusses particularly on developing the four types of skills outlined above:

1. Training for technical skills. Although firms increasingly seek to recruit personnel who are already technically trained, they make a distinction between technical skills that can be learned outside the firm and those that are linked to firm-specific technologies. Because the latter are increasingly important as a strategy for firms to distinguish their services in the marketplace, we find a growing emphasis on firm-based technical training. For example, firms with their own audit methods, proprietary software, or signature report-writing styles have to provide training to even the most educationally advanced new hires. Interestingly, few managers report that this area of training is problematic, and they in fact characterize their highly educated trainees as "quick studies." The fact that their employees are experienced <u>as students</u> certainly contributes to this success.

2. Customer-service skills training. With the spread of computer/video technologies, many firms are centering communications training around the use of particular technologies. Short courses may be used to introduce workers to computer graphics software, for example, or other techniques useful in both client and in-house communications. In addition, a growing number of firms is offering training in proposal

writing and verbal communications, and managers report that a surprising proportion of upper-level workers are taking advantage of these offerings. Again, a pervasive culture of achievement and self-improvement supports the success of such training. In addition, customer service techniques are increasingly "institutionalized"; that is, they have become integral parts of a firm's mode of doing business, a key part of its marketing image. In such cases, customer service training is increasingly indistinguishable from the basic training received by all new hires.

3. Training in industry specializations. Many of the firms we visited were in the process of expanding firm-based training designed to teach workers about clients' businesses. These efforts tend to be aimed at senior professionals, particularly those who are responsible for managing assignments and generating new business. The trend has generated an explosion in the number and attendance of seminars given by specialists in client industries.

4. Salesmanship training. Selling skills are rarely taught explicitly but rather through a combination of training in communications skills and knowledge of industry specializations. Various ways of reorganizing labor also help to convey information about how to approach clients and push new products. By organizing teams for "cross-selling," for example, or by assigning junior personnel to work with entrepreneurial senior personnel, firms set up work situations in which inexperienced

employees can learn about other services available in the firm and can observe product innovation and expert salesmanship by senior staff. By structuring a system of rewards for selling services to new or existing clients, some firms have built in incentives for employees to master salesmanship techniques.

In general, training in the business services sectors we have examined assumes that employees will be able to learn quickly and that they will be willing to engage in retraining continually throughout their careers. Ad hoc training works well in this sector in large part because employees tend to have a positive and flexible attitude toward retraining rather than viewing it as a sign of deficiency. Further, the emphasis on a sharp distinction between generic and firm-based skills makes a great deal of training necessary for all employees -- from junior professionals to senior managers -- and eliminates the stigma attached to the status of "trainee." This flexible approach to training has certainly contributed to the sector's competitive success internationally and has supported firms' commitments to operating on the "cutting edge" of their special fields.

Training in business services: A case study

Arthur Andersen & Co. is one of the "Big 6" accounting firms, with anticipated worldwide revenues well over $ 3 billions for 1989. Its origins date back to 1913, when Arthur Andersen and

Clarence Delany purchased the Audit Company of Illinois from the estate of deceased C.W. Knisely, its previous owner and manager.

Based in Chicago, the firm began its domestic expansion in the early 1920s and its overseas expansion in the early 1930s when it arranged for several foreign accounting partnerships to serve some of its clients in their markets. Over the years, however, the firm grew increasingly dissatisfied with its correspondent system, because of the difficulties in controlling quality of service. In the 1950s, the company reversed its earlier policy, terminated almost all of its correspondent arrangements, and shifted to a foreign expansion strategy based exclusively on the development of its own local practices. Arthur Andersen pursued this strategy exclusively until 1985, when Sycip, Gorres, Velayo & Co. merged with it. SGV & Co. is a Philippine-based partnership with which the firm had maintained one of its very few remaining correspondent arrangements.

This helps underline two points. First, the firm has a very strong history and culture of internal growth. In that sense it differs from most other Big 6 firms, which have typically grown over the years by joining forces with established partnerships. Second, like other large accountancies, the firm is heavily internationalized. In 1988, Arthur Andersen employed nearly 46,000 staff, almost half of whom was employed overseas.

Arthur Andersen offers services in the areas of accounting and audit, tax consulting, and management information consulting services. Its $ 1.1 billion worldwide accounting and audit

revenues in 1988 made it the fifth largest audit firm in the world (the second largest in the United States after KPMG). In tax services, the firm ranked second both in the United States and worldwide (with 1988 worldwide revenues worth $ 580 million). Finally, with $ 1.1 billion worldwide revenues in management information consulting, primarily in the area of systems integration, the firm ranked as the sixth largest worldwide in the broad field of data processing and computer software. The firm tax consulting and even more so management information consulting practices have grown much faster than its audit practice during the 1980s. Between 1984 and 1988, management information consulting tripled in size, tax services roughly doubled, while audit increased by approximately 60 percent.

The firm's skill needs during the 1980s have been shaped both by the changes in the nature of work and expertise demanded from the firm, and by the particular circumstances under which these changes have occurred. With respect to the latter, five factors have weighed heavily in some of the firm's strategic choices: a very rapid rate of expansion, including rapid international expansion; a very rapid rate of diversification in the firm's activities; high turnover rates among junior personnel; a growing need for high level specialists; and a very strong emphasis on developing firm-specific services, that can keep Arthur Andersen at the cutting of its fields of expertise.

In terms of skills, one senior executive summarized the firm's human resources needs as follows:

1. hire smart and motivated people;

2. train heavily in technical skills;

3. emphasize strong, firm-specific behaviors, including communications skills. Consistent behavior is fundamental in establishing and preserving the firm's image in the market place;

4. train people in developing those below them; train individuals in getting maximum leverage from their time by learning how to delegate to others;

5. sell aggressively;

6. train individuals for gauging properly what they promise and for delivering on it;

7. train for team work;

8. reward for accomplishments.

As in other firms in this and other sectors, the firm has responded to these challenges through a mix of solutions involving the labor market and training.

In 1988 the firm recruited approximately 5,000 new staff to accommodate its expansion and replace departures (There was an additional, large increment in new staff as a result of the merger with SGV & Co.) These numbers were high partly because of high turnover among new recruits which the firm estimate at approximately 25 percent annual during the first two years. Over the long run, less than one out of ten new hires will stay with the firm until reaching partnerships, a process which takes between ten and 13 years on average. Most entry-level recruits

are four-year college graduates from accounting or equivalent programs in the audit and tax divisions and four-year college graduates from computer sciences and a variety of other fields in the management information consulting division; outside the United States, the firm seeks to recruit individuals with fairly similar levels and types of educational preparation.

Despite a tradition of a very strong internal labor market, the firm began turning to the external labor markets for high-level specialists during the second half of the 1980s. As of late 1987, in the United States alone, the firm employed over 600 specialists that had been recruited directly as managers (the rank next below partner), compared to none three years earlier. At that time, the firm envisioned hiring approximately 500 additional specialists annually over the following three years in the United States.

Most specialists were hired to fulfill needs in the tax and management information consulting divisions. In the tax practice, they were mostly individuals with MBAs or Law degrees, a specialization in a particular field of taxation, and sometimes a network of existing or potential clients. In the information consulting practice, these were people with specialization in systems analysis or systems engineering, increasingly with a computer science or engineering background, and less so with a business school background, as was the case when the firm first moved into the field.

The firm's reasons for switching to the external markets involved partly keeping up with the need to find senior professionals to keep up with explosive demand for the firm's services and partly the recognition that those are fields in which expertise is built in part through job-hopping.

The firm's massive hiring of new personnel, both entry-level and experienced, implies extensive training costs. In 1986, the firm's estimated training costs were $135 million compared to $1.9 billion annual revenues; in 1987, $195 million compared to $2.3 billion annual revenues; in 1988, $250 million compared to $2.8 billion annual revenues. These figures translated respectively into 7 percent, 8.5 percent and 9 percent of annual revenues, a set of truly staggering numbers. (In all likelihood these numbers are higher than those of competitors, although training is clearly intensive throughout the industry.) These costs include the operation and maintenance of the firm's training facilities, the costs of trainers and of the development of training materials, and the wages and salaries of employees while being trained. Between 1983 and 1987, the firm estimated that the number of employee training hours grew from 4.2 to 6.8 million hours. For 1987 alone, this translated in over 170 hours of training per employee, or over <u>four weeks worth of training</u>. In practice, the distribution is skewed towards newer employees.

Training can be either centralized or decentralized. Training that is directed at country-specific technical knowledge (e.g. local tax laws, local accounting regulations) is partly

done at the field office level. Training that is methods-oriented or that focuses on behaviors is done centrally. Centralized training accounts for the bulk of the firm's training.

For nearly 20 years, most of the firm centralized training needs have been met at the St. Charles Center for Professional Education, a former four-year college campus located outside Chicago, which the firm purchased in 1970. In recent years, the firm has begun decentralizing some of its education programs to Segovia (Spain) and Mexico City. The extent of decentralization remains limited, however, because bringing everyone into a single facility is considered part of the process that contributes to forging strong bounds among individuals working around the world, a strong esprit de corps and a unique firm culture. Thus, on average, new recruits in audit will spend two weeks per year at St.Charles for the first three years; new recruits in information consulting, three weeks per year. St. Charles facilities can already accommodate 4,000 students at any one time, with appropriate sleeping accommodations, and are being expanded.

The firm also uses training facilities in Geneva, where its world headquarters are located. These are for advanced training of its partners.

The firm uses very few full-time teachers. Most teaching is done by managers and partners. A main responsibility of full-time teachers is to develop and improve firm-specific methods with managers and partners, and the training curricula and materials that go with them.

Most teaching carried out at St. Charles focuses on the firm's proprietary methods and on behaviors. St. Charles puts out a course catalogue, which looks like a college course catalogue and in which it offers over 400 classroom courses lasting from a one-hour introduction course to office automation to a 64-hour advanced computer systems design course. On average courses last between 15 and 25 hours.

Behavior is an area that has been strengthened in recent years. The firm has put in place multi-year training sequences for "management development skills" in each of its divisions. In the consulting practice, for example, during their first visit at St. Charles, new hires must take an eight-hour interviewing technique course, which is aimed at assisting them in the development of their systems development skills. During year two, students enroll in a "support development" course, during which they are taught to supervise teams of programmers. During year three, the training sequence emphasizes the development of "interpersonal styles": communications with clients, sales skills and so on. During the fourth year, "leadership and motivation" are emphasized. Over the following few years, students receive additional training in "proposing for new business" and "professional sales techniques". Throughout this entire sequence, strong emphasis is placed on the development of such skills as effective public speaking, effective writing, effective communications through listening, negotiation techniques with clients, small group facilitating, and so on.

In the area of methods, the nature of the firm's product has changed over the 1980s, owing in part to the introduction of microcomputers. Each division has its own methods sequence. In addition, the firm offers an extensive sequence of industry specialization courses, focusing on sectoral accounting approaches and geared mostly, but not exclusively, to the auditors and the tax consultants. Prior to 1982, the firm did not teach a single audit course using microcomputers. Use of mainframe and minicomputer for audit data sampling and extracting was being taught, however. Today, most courses use microcomputers. Audits and tax work are run almost exclusively on microcomputers, using Lotus 1-2-3 (previously Visicalc) and proprietary software to extract data from the client's computer. Today's management information consulting work relies heavily on computers.

This example helps to illustrate the way in which firms in the business services have made training an integral part of a broader competitive strategy which emphasizes market anticipation, product development, aggressive sales being done throughout the organization, and international marketing. The example also shows the close connections between training and organizational strategies such as encouraging teamwork and employee mobility through various fields of specialization. Finally, the case supports the observation that training in business services is focussed on middle-level professionals to a degree that would be unheard of in most U.S. manufacturing

sectors, but that is quite consistent with strategies in services sectors such as retailing where training of lower-level workers is extensive but remains fairly narrow in focus.

Table 5.1
Employment Growth in Business and Related Services
1970-1986

	Employment (,000)			Growth %	
	1970	1980	1986	1970-80	1980-86
Total Private Sector	57 265	74 835	83 380	30.7	11.4
Business Services	1 632	2 996	4 613	83.6	54.0
Advertising	115	140	168	21.7	20.0
Computer Software & D.P.	na	303	553	na	82.5
Mngt. Consulting & Public Rel.	288	324	562	12.5	73.5
Temporary Empl. Agencies	na	569	971	na	70.7
Services to Buildings	288	497	636	72.6	30.0
Legal Services	237	503	746	112.2	48.3
Misc. Services	590	925	1 410	56.8	52.4
Engineering & Architectural	261	523	706	100.4	35.0
Accounting	200	302	432	51.0	43.1
Total Business & Rel. Services	2 459	4 424	6 769	79.9	53.0

Source: County Business Patterns, several years, in Thierry Noyelle, "Skill Needs and Skill Formation in Accounting, Management Consulting and Software" (Conservation of Human Resources, Columbia University, July 1989)

Table 5.2
Worldwide and U.S. Revenues of Accounting
Management Consulting and Software, 1983-1987
($ billion)

	1987 Worldwide	1987 US	1983 US
Accounting/Auditing	50-60	26.5	17.0
Management Consulting	80-90	45.0	28.0
Software/Data Processing	100-120	60.0	35.0

Source: U.S. Industrial Outlook, 1988 and 1989, and independent estimates from T. Noyelle, "Skill Needs . . ." op. cit.

Table 5.3
20 Largest Management Consulting Firms, 1987

	Firm	Country	Worldwide Revenues[1] ($ millions)	U.S. Revenues[1] ($ millions)	Number of Professionals Worldwide[1,3]
1	Arthur Andersen	U.S.	838	522	9 600
2	Marsh & McLennan	U.S.	530	393	6 400
3	McKinsey	U.S.	510	255	1 600
4	Towers Perrin	U.S.	465	380	3 085
5	Peat Marwick	U.S.	438	253	4 700
6	Booz Allen	U.S.	412	345	2 100
7	Coopers & Lybrand	U.S.	381	199	4 700
8	Ernst & Whinney	U.S.	374	230	3 255
9	Price Waterhouse	U.S.	345	160	4 300
10	Saatchi & Saatchi	U.K.	267	176	1 500
11	Touche Ross	U.S.	248	157	2 100
12	Wyatt	U.S.	237	207	1 600
13	Arthur D. Little	U.S.	218	151	1 500
14	Deloitte Haskins	U.S.	209	91	2 300
15	Arthur Young	U.S.	204	133	2 400
16	Bain	U.S.	200	140	800
17	PA Management Consult.	U.K.	175[2]	na	na
18	Alexander Proudfoot	U.S.	170	60	1 100
19	Hewitt Associates	U.S.	161	152	1 400
20	American Management Systems	U.S.	145	145	1 600
			6,527	4,149	

[1] Management advisory service revenues only.
[2] 1986 revenues.
[3] As defined by company--does not include support staff.

Source: Consulting News, The Economist.

VI. Conclusions

The sectoral studies presented in this report confirm the finding that U.S. firms have substantially increased their commitment to training in recent years. Changes in the competitive environment brought about by systemic shifts -- internationalization of the economy, market transformations, and industry restructuring -- have placed new demands on workers at all levels of employment. How firms relate new types of training to other adjustments in technology, labor recruitment, or the organization of work differs substantially by sector. Although our studies are not based on representative samples of firms, they also suggest that a wide range of responses by firms exists within sectors.

The most revealing contrast between sectors is that between business services and the textile industry. These sectors are at very different stages of development, and they also have a strikingly different orientation toward the labor market. The mature textile industry finds itself unable to propagate a growth model based on employing mainly unskilled, poorly educated workers, yet it cannot recruit better trained workers in sufficient numbers. Business service firms, in contrast, have been peculiarly successful in finding employees with higher levels of education and more specialized skills. It is for quite

different reasons, then, that training has become more important in the two sectors. For textiles, enhancing training allows firms to implement known responses to the new competitive climate (new technologies, just-in-time); for business services, upgrading workers' skills is a goal that is virtually indistinguishable from that of ensuring the quality of services and staying at the cutting edge of product innovation.

While external labor markets clearly affect the role of training, internal organization has a more subtle relationship to training. In the example of the investment bank in Section 2, and in many of the small management consultancies described in Section 5, the introduction of new types of training has gone hand in hand with the adoption of more flexible work structures. More frequent rotation of personnel through jobs or units, the creation of project teams, the reorganization of departments to include multiple functions and broader cross-sections of personnel -- these and other organizational changes have been made in conjunction with changes in training. In the textile industry, in contrast, despite the concessions made in implementing quick response, the emphasis has been mainly on retraining of workers to perform new tasks in the context of traditionally defined positions. Retailing is an interesting hybrid case; training programs have remained fairly narrow in focus at lower levels where work organization has also changed little, while in management ranks training has broadened as jobs have been substantially restructured.

The examples suggest the conclusion that the discussion of worker training must be broadened considerably. Although the dearth of basic skills among U.S. workers is an important problem in all the sectors, the evidence is that the most poorly educated workers are simply not making it into the work force and that firm-based training in fact constitutes just one element of a larger organizational strategy for most firms. Put differently, increasing resources for training without other changes in the work place may prove relatively ineffective in promoting either improved competitiveness or establishing structures that support lifelong learning for workers and greater job satisfaction.

In the more dynamic firms covered by this report we find elements of a successful blending of training with the promotion of larger goals. It has not been the purpose of this report to provide evaluations of training programs, but some of the elements of successful training that we have identified merit comment:

1. Management involvement. Training programs appear to have a much greater impact both on organizations and on individuals when they extend to management ranks. This includes both facilitating management skill upgrading and reorganizing management tasks. Including management and middle-level professional workers in training can have the effect of making training more acceptable to the rest of the work force. Failure to achieve minimum synergy in retraining and organizational change between shop-floor employees and managers seems to be a

particularly serious problem in older U.S. manufacturing. Part of the explanation may lie in historical differences in the development of those sectors. The extent of the division of labor in the service sector has probably never been as sharp as it has become in manufacturing. Put more simply, the organizational gap between managers and workers is far greater in the latter than in the former.

2. Restructuring jobs to make them more interesting to employees. The accelerated pace of change in the work place, together with the need for more rapid and more flexible responses to market shifts, questions the value of simply retraining workers to perform new sets of routinized tasks. In contrast, structuring jobs that necessitate worker decision-making has the advantage that it builds incentives to learn into every job. By performing more varied tasks, rotating jobs, or contributing to company policy and product decisions, employees learn more on the job. Although such changes do not by themselves make training programs successful, they are often essential to their success.

3. Centralized as well as decentralized locations for training. Firms need both training planning at a high level in the organizations and the facility to implement training spontaneously within decentralized divisions. Firms that have succeeded in implementing such training practice have facilitated this combination by allowing division managers to draw personnel and funds from a central training unit when needed and by

involving operating managers much more directly in the training process. Other solutions are clearly possible.

4. An emphasis on open, flexible ties between firm-based training and formal education. Many firms have established systems of tuition assistance or other support for employees to continue outside education. Others have set up customized training for their workers in partnership with community colleges or other educational institutions. Such arrangements are increasingly important as the relationship between specific educational training and work-related skills becomes more complex. With most technology-specific training taking place inside firms, this open, flexible relationship with formal educational seems most appropriate; traditional degree programs in many vocational fields duplicate resources without preparing workers to handle the latest technology or providing them with the broader skills needed to handle increasingly complex jobs.

5. Promoting a working environment which not only facilitates continuous learning by individual workers, but also facilitates organizational learning. In the new market environment described in the introduction and the case studies presented in this report, sustained firm competitiveness is increasingly becoming tied to a firm's capacity to learn and respond to rapid shifts in demand. Putting in place organizations that are organizationally flexible enough to respond rapidly to the need for strategic shifts is something that, at best, very few firms have achieved. A possible

explanation is that firms are leery of giving too much room for individual initiative, leading possibly to organizational anarchy, or, put in a more positive way, have yet to learn how to structure mechanisms that allow for intense feed-back and utilization of feed-back information, without creating chaos. However, finding ways to promote this learning/innovative firm environment is becoming, more than ever, a competitive imperative.

Training clearly has played a significant role in the competitive strategies of lead firms in the sectors treated in this report. The small, innovative firms in the software industry; the market-savvy regional retail chains; the aggressive investment banks; and the textile firms dominating special market niches -- in all these cases, significant shifts to adjust to changing market conditions simply would not have been possible without important changes and heavy investments in training. Often ad hoc additions to existing programs, those changes have the potential to combine with other reforms in the structure of work and the nature of workplace relations in a way that will both benefit workers and enhance competitiveness.